This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

NYPL RESEARCH LIBRARIES
3 3433 07482541 9

THE NEW YORK PUBLIC LIBRARY
REFERENCE DEPARTMENT

This book is under no circumstances to be taken from the Building

THE NEW YORK PUBLIC LIBRARY
ASTOR, LENOX AND TILDEN FOUNDATIONS
525576

Published monthly by the
University of the State of New York

High School Department

Bulletin 17

NEW YORK STATE SCIENCE TEACHERS ASSOCIATIO

PROCEEDINGS OF THE

SIXTH ANNUAL CONFERENCE

Held at Syracuse University, Syracuse, December 27-28, 1901

PAGE
Summary of sessions 521
Summary of action 527
Addresses, papers and discussions 530
Research Work in the Training of the Science Teacher: Prof. S. J. SAUNDERS 532
Study of Types: Prof. N. A. HARVEY 554

Section meetings

Section A. Physics and chemistry

Preparation and Training of the Teacher of Physics: Prof. C. B. THWING 577
Preparation and Training of the Teacher of Chemistry: Dr L. C. NEWELL 595

Section B. Biology

Preparation of Secondary Teachers in Biology: Prof. F. E. LLOYD. 607
What the Teacher of Botany in Secondary Schools should be Prepared to Do: Dr A. J. GROUT 615

Section C. Earth Science

Geography for Training Students in Normal Schools: Prof. A. W. FARNHAM 618
Prof. C. STUART GAGER 622

Section D. Nature Study

Minimum Nature Study Training for a Teacher in an Elementary School: Sup't D. L. BARDWELL 630
Where and How can Nature Study Training be Obtained? Miss ELIZABETH CARSS 634
A Teachers Class in Nature Study: C. K. BEACH 643

Section A. Physics and chemistry

College Entrance Preparation from the Secondary School Man's Standpoint: Prof. R. J. KITTREDGE ....
Chemical Laboratory Notes: Prof. C. M. ALLEN ....
How to Meet the Problem of Teaching Physics by the Laboratory Method in Secondary Schools: F. M. GILLEY ....

Section B. Biology

Ideals in Teaching: Prof. A. D. MORRILL ....
Training a Science Teacher for Secondary Schools: Prof. N. A. HARVEY ....

Section C. Earth Science

Report of the Committee of Seven: Prof. R. E. DODGE ....

Section D. Nature Study

Prof. C. R. DRUM ....

General session

A Standard College Entrance Option in Botany; committee report: Prof. F. E. LLOYD ....

Symposium

What Ought the High School Teacher in Each Science to Know, be Able to Do and What are his Opportunities for Self-Improvement? Prof. L. C. NEWELL ....
Stimulants and Narcotics; report: Prof. I. P. BISHOP ....
Alcohol Physiology in the Public Schools: Prof. W. O. ATWATER
Members ....
Attendants ....
Index ....

ALBANY
UNIVERSITY OF THE STATE OF NEW YORK
1902

[illegible]

Price 40 cen

University of the State of New York

REGENTS

With years of election

1892 William Croswell Doane D.D. LL.D. *Vice Chancellor*, Albany
1873 Martin I. Townsend M.A. LL.D. – – – Troy
1877 Chauncey M. Depew LL.D. – – – New York
1877 Charles E. Fitch LL.B. M.A. L.H.D. – – Rochester
1878 Whitelaw Reid M.A. LL.D. – – – New York
1881 William H. Watson M.A. LL.D. M.D. – – Utica
1881 Henry E. Turner LL.D. – – – – Lowville
1883 St Clair McKelway M.A. L.H.D. LL.D. D.C.L. Brooklyn
1885 Daniel Beach Ph.D. LL.D. – – – Watkins
1888 Carroll E. Smith LL.D. – – – – Syracuse
1890 Pliny T. Sexton LL.D. – – – – Palmyra
1890 T. Guilford Smith M.A. C.E. LL.D. – – Buffalo
1893 Lewis A. Stimson B.A. LL.D. M.D. – – New York
1895 Albert Vander Veer M.A. Ph.D. M.D. – – Albany
1895 Charles R. Skinner M.A. LL.D. Superintendent of Public Instruction, ex officio
1897 Chester S. Lord M.A. LL.D. – – – Brooklyn
1897 Timothy L. Woodruff M.A. Lieutenant Governor, ex officio
1899 John T. McDonough LL.B. LL.D. Secretary of State, ex officio
1900 Thomas A. Hendrick M.A. LL.D. – – – Rochester
1901 Benjamin B. Odell jr LL.D. Governor, ex officio
1901 Robert C. Pruyn M.A. – – – – – Albany
1902 William Nottingham M.A. Ph.D. – – – Syracuse
One vacancy

SECRETARY

Elected by Regents

1900 James Russell Parsons jr M.A. LL.D.

DIRECTORS OF DEPARTMENTS

1888 Melvil Dewey M.A. LL.D. *State Library and Home Education*
1890 James Russell Parsons jr M.A. LL.D. *Administrative, College and High School Dep'ts*
1890 Frederick J. H. Merrill Ph.D. *State Museum*

Unive[illegible] the State of New York

High School Department

INCLUDING ACADEMIES AND ALL INTERESTS OF [illegible]

THE NEW YORK
PUBLIC LIBRARY
ASTOR, LENOX AND
TILDEN FOUNDATIONS
1913 L

Bulletin 17

New York State Science Teachers Association

PROCEEDINGS OF THE

SIXTH ANNUAL CONFERENCE

Held at Syracuse University, Syracuse, December 27-28, 1901

SUMMARY OF SESSIONS

Friday, December 27, 9.30 a. m.

Meeting of executive council

Registration

Opening session; called to order by Professor CHARLES W. HARGITT, Syracuse University

Address of welcome

Professor CHARLES W. HARGITT

Response

Professor FRANKLIN W. BARROWS, Buffalo Central High School, president-elect

Value of Research Work in the Training of the Science Teacher

Professor SAMUEL J. SAUNDERS, Hamilton College, Clinton

Discussion

Professor CHARLES W. HARGITT, Syracuse University
Professor A. J. GROUT, Brooklyn Boys High School
Inspector ARTHUR G. CLEMENT, Regents office, Albany
Professor FRANKLIN N. JEWETT, Fredonia Normal School
Professor GEORGE M. TURNER, Masten Park High School, Buffalo
Professor N. A. HARVEY, Chicago (Ill.) Normal School
Professor SAMUEL J. SAUNDERS, Hamilton College
Professor ALBRO D. MORRILL, Hamilton College, Clinton

Friday, 2 p. m.

General session

The Study of Types

Professor N. A. Harvey, Chicago (Ill.) Normal School

Discussion

Professor Grant Karr, Oswego Normal School
Professor Charles W. Hargitt, Syracuse University
Professor N. A. Harvey, Chicago (Ill.) Normal School
Professor Albert P. Brigham, Colgate University, Hamilton

Friday, 4 p. m.

Section meetings

Section A—Physics and chemistry. Professor J. M. Jameson, Pratt Institute, Brooklyn, *chairman*

Preparation and Training of the Teacher of Physics

Professor Charles B. Thwing, Syracuse University

Discussion

Professor George M. Turner, Masten Park High School, Buffalo
Professor W. M. Booth, Cortland Normal School
Professor Charles B. Thwing, Syracuse University
Inspector Charles N. Cobb, Regents office, Albany
Professor Howard Lyon, Oneonta Normal School
Professor Charles F. Binns, N. Y. State School of Clay Working and Ceramics, Alfred
Professor H. J. Schmitz, Geneseo Normal School

Preparation and Training of the Teacher of Chemistry

Professor Lyman C. Newell, Lowell (Mass.) Normal School

Section B—Biology. Professor Henry R. Linville, DeWitt Clinton High School, New York, *chairman*

Preparation of Secondary Teachers in Biology

Professor Francis E. Lloyd, Teachers College, New York

Discussion

Inspector Arthur G. Clement, Regents office, Albany
Professor Francis E. Lloyd, Teachers College, New York
Professor Henry R. Linville, DeWitt Clinton High School, New York
Professor Frank M. McMurry, Teachers College, New York

What the Teacher of Botany in Secondary Schools should be Prepared to Do

Professor A. J. GROUT, Brooklyn Boys High School

Discussion

Professor FRANCIS E. LLOYD, Teachers College, New York

Section C—Earth science. Professor RICHARD E. DODGE, Teachers College, New York, *chairman*

Geography for Training Students in Normal Schools

Professor AMOS W. FARNHAM, Oswego Normal School

Professor C. STUART GAGER, New York State Normal College, Albany

Relations of Life to Environment

Principal C. T. MACFARLANE, Brockport Normal School

Position of Anthropo-geography in Normal School Teaching

Professor W. S. MONROE, Westfield (Mass.) Normal School

Discussion

Professor FRANK CARNEY, Ithaca High School

Professor ALBERT P. BRIGHAM, Colgate University, Hamilton

Professor C. STUART GAGER, New York State Normal College, Albany

Principal C. T. MACFARLANE, Brockport Normal School

Professor W. S. MONROE, Westfield (Mass.) Normal School

Professor RICHARD E. DODGE, Teachers College, New York

Section D—Nature study. Mrs MARY ROGERS MILLER, College of Agriculture, Cornell University, Ithaca, *chairman*

What is the Minimum Nature Study Training for a Teacher in an Elementary School?

Superintendent DARWIN L. BARDWELL, Binghamton High School

Discussion

Mrs MARY ROGERS MILLER, Cornell University, Ithaca

Superintendent DARWIN L. BARDWELL, Binghamton High School

Where and How can Nature Study Training be Obtained?

Miss ELIZABETH CARSS, Teachers College, New York

Miss ALICE CYNTHIA KING, Utica City Training School

Discussion

Mrs Mary Rogers Miller, Cornell University, Ithaca
Professor C. S. Sheldon, Oswego Normal School
Professor Arthur E. Hunt, Manual Training High School, Brooklyn
Professor N. A. Harvey, Chicago (Ill.) Normal School
Professor John W. Spencer, Cornell University, Ithaca
Superintendent I. E. Young, New Rochelle High School

Suggestions for a Teachers Class in Nature Study

Principal Channing E. Beach, Buffalo school 23

Saturday, December 28, 9.30 a. m.

Section A—Physics and chemistry. Professor J. M. Jameson, Pratt Institute, Brooklyn, *chairman*

College Entrance Preparation of Students, as Viewed from the Secondary School Man's Standpoint

Professor R. J. Kittredge, Schenectady Union Classical Institute

Discussion

Professor H. J. Schmitz, Geneseo Normal School
Professor Charles F. Binns, N. Y. State School of Clay-Working and Ceramics, Alfred

Chemical Laboratory Notes

Professor Charles M. Allen, Pratt Institute, Brooklyn

Discussion

Professor Ernest N. Pattee, Syracuse University
Professor Durward E. Burchell, Oswego Normal School
Professor Charles M. Allen, Pratt Institute, Brooklyn

How to Meet the Problem of Teaching Physics by the Laboratory Method in Secondary Schools

Professor Frank M. Gilley, Chelsea (Mass.) High School

Section B—Biology. Professor Henry R. Linville, DeWitt Clinton High School, New York, *chairman*

Ideals in Teaching

Professor Albro D. Morrill, Hamilton College, Clinton

Discussion

Professor Henry R. Linville, DeWitt Clinton High School, New York
Professor A. J. Grout, Brooklyn Boys High School

Professor A. D. Morrill, Hamilton College, Clinton
Professor N. A. Harvey, Chicago (Ill.) Normal School
Professor Charles W. Hargitt, Syracuse University
Professor Francis E. Lloyd, Teachers College, New York
Professor Eugene B. Callahan, Richfield Springs High School

The Training of a Science Teacher for Secondary Schools
Professor N. A. Harvey, Chicago (Ill.) Normal School
Discussion
Professor Francis E. Lloyd, Teachers College, New York
Professor A. J. Grout, Brooklyn Boys High School
Professor Charles W. Hargitt, Syracuse University
Professor Grant Karr, Oswego Normal School

Section C—Earth Science. Professor Richard E. Dodge, Teachers College, New York, *chairman*

Report of the committee of seven
Professor Richard E. Dodge, Teachers College, New York
Discussion
Inspector Charles F. Wheelock, Regents office, Albany
Miss Elizabeth E. Meserve, Utica Free Academy
Professor Albert P. Brigham, Colgate University, Hamilton
Professor W. W. Clendennin, Wadleigh High School, New York
Professor Frank Carney, Ithaca High School
Principal George H. Walden, Rochester school 10

Section D—Nature study. Mrs Mary Rogers Miller, College of Agriculture, Cornell University, *chairman*

Informal talk
Principal C. R. Drum, Montgomery School, Syracuse
Discussion
John W. Spencer, Syracuse University
Principal C. R. Drum, Montgomery School, Syracuse
Informal talks
Miss Elizabeth Whittaker, Brookton
Miss Mary E. Hill, Goodyear-Burlingame School, Syracuse
Miss Bessie DeWitt Mershon, Utica
Principal R. J. Round, Elmira school 3

Saturday, 11.15 a. m.

General session

Report of committee on a standard college entrance in botany

Professor Francis E. Lloyd, Teachers College, New York

Symposium: What Ought the High School Teacher in each Science to Know? What Ought he to be Able to Do? What are his Opportunities for Self-improvement?

Professor Lyman C. Newell, Lowell (Mass.) State Normal School

Professor Henry R. Linville, DeWitt Clinton High School, New York

Saturday, 2 p. m.

General session

Report of progress of the committee on stimulants and narcotics presented by

Professor Irving P. Bishop, Buffalo Normal School, *chairman*

Alcohol Physiology in the Public Schools

Professor W. O. Atwater, Wesleyan University, Middletown Ct.

Statement concerning Steele's *Hygienic Physiology*

Mrs Mary H. Hunt, superintendent of scientific department of Woman's Christian Temperance Union

Discussion

Dr Henry D. Didama, Syracuse University

Mrs Mary H. Hunt, superintendent of scientific department of Woman's Christian Temperance Union

Professor Irving P. Bishop, Buffalo Normal School

Professor Burt G. Wilder, Cornell University, Ithaca

Mrs Ella A. Boole, Brooklyn, president of New York State Woman's Christian Temperance Union

Professor Albert P. Brigham, Colgate University

Mrs Cora D. Graham, Syracuse, Frances Willard Memorial Union

Professor Frank Carney, Ithaca High School

Professor Richard E. Dodge, Teachers College, New York

Mrs Martha M. Allen, superintendent nonalcoholic medication for national Woman's Christian Temperance Union

Adjourned

SUMMARY OF ACTION

Appointments

Friday afternoon the following committees were appointed to report at the final session.

Nominations. Professor W. H. Lennon, Brockport, chairman; E. R. Whitney, Binghamton; Professor George M. Turner, Buffalo.

Resolutions. Professor Francis E. Lloyd, New York, chairman; Arthur G. Clement, Albany.

Auditing committee. O. C. Kenyon, Syracuse, chairman; John W. Greenwood, Buffalo.

Report of meeting of executive council

Saturday afternoon the secretary made the following oral report:

Recommended, That the association pay to the Regents office for proceedings of the fourth annual meeting, $50.

That the bill for postage for mailing to members the proceedings of the fifth annual meeting be paid, $27.

That the bill for reprints of the papers read at the fifth annual meeting be approved, $62.61.

That the bills for taking and transcribing the notes at the fifth annual meeting be paid, $62.75.

That the expenses of the committee on narcotics be paid by the association, $30.

The secretary stated further that at the meeting of the executive council held at the Hotel Warner the previous evening the place for the next meeting was discussed; that the invitation from Buffalo was presented and discussed, and that it was finally

Voted, That it be recommended to the association that the city of Syracuse be selected for the next annual meeting, and that Prof. Lovell be appointed a committee of one to confer with the Associated Academic Principals and if possible arrange for a session in unison.

Also that, on the recommendation of Prof. Dodge, it was

Voted, That there be appointed a chairman and secretary for each of the four sections, and that the appointment thereof be left in the hands of the president and council.

All the recommendations of the executive council were unanimously approved and adopted.

Treasurer's report

For the year ending Dec. 28, 1901

Receipts

From O. C. Kenyon, treasurer	$226 54	
Annual dues	128 ..	
Interest	1 50	
		$356 04

Payments

Stenographers for the fifth annual meeting	$62 75	
Stationery and blanks	12 75	
1899 reports, paid to the Regents	50 ..	
Postage	10 ..	
Mailing 1900 reports	27 ..	
Reprints, J. B. Lyon	62 61	
Printing programs and letter	22 50	
Mailing programs and letter	13 ..	
Express and cartage	1 45	
Five dinner tickets for guests	3 75	
C. W. Hargitt, expense	65	
F. W. Barrows, expense	4 15	
H. R. Linville, expense	50	
Trunk Line Association	4 ..	
Labor and clerk hire	27 ..	
		302 11
Balance on hand Dec. 27, 1901		$53 93

Committee reports

Nominations. The committee recommended the following as officers of the association for the ensuing year, and they were unanimously elected.

President, William Hallock, Columbia University

Vice-president, Howard Lyon, Oneonta Normal School

Secretary and treasurer, A. R. Warner, Auburn High School

Executive council, E. S. Babcock, Alfred University; H. J. Schmitz, Geneseo Normal School; W. M. Bennett, Rochester High School

Resolutions. The following resolutions were reported and adopted.

We, the members of the New York State Science Teachers Association, assembled in conference at Syracuse N. Y. Dec. 27 and 28, 1901, do hereby extend our most hearty thanks to those who have so liberally contributed to our comfort and convenience,

To the city of Syracuse for the use of the city hall where we are at present.

To the university authorities, and more specially to the dean and faculty of the medical college, for their courtesy in extending to the association the use of their building.

And to Prof. C. W. Hargitt, Mr O. C. Kenyon and Mr J. D. Wilson, the local committee, for the efficient way in which they have arranged for the details of the meeting.

We hereby resolve that a copy of this minute be copied on the records of the association, and that the secretary be instructed to convey in writing the sense of the resolution to those mentioned.

The following resolution from the earth science section was presented and adopted.

Resolved, That the committee of seven be continued for one year, that they may outline a series of laboratory exercises in physical geography, and suggest a course of study in geography for elementary schools.

Auditing committee. The auditing committee has examined the accounts and report of the treasurer, A. R. Warner, and finds them to be correct.

John W. Greenwood
O. C. Kenyon

Miscellaneous

Friday afternoon Inspector Charles N. Cobb called attention to the fact that in connection with the Associated Academic Principals meeting there had been arranged an exhibit of science apparatus for physics and chemistry particularly, on the second floor of the Yates hotel at the end of the corridor at the left after leaving the elevator.

ADDRESSES, PAPERS AND DISCUSSIONS

Friday morning, December 27

GENERAL SESSION

Prof. C. W. Hargitt—In the absence of the retiring president, I have been asked as chairman of the local committee to call the meeting to order and to introduce the president-elect. It is not necessary to spend time in words of formal welcome. The sixth annual session makes the third out of a series held in Syracuse, and the second of a series held in this building. I am very sure that those of you who have been at previous meetings are quite aware of the fact that as teachers and as science teachers, you are welcome in Syracuse and here in this building. I think moreover that no words of mine are necessary in the way of congratulation to the science teachers of the state on the work of this association in the past years of its history. A glimpse at the program in the standard of work proposed for this meeting and in the quality of material in the way of speakers provided to participate in the work of the session is sufficiently assuring on this point. We have been strikingly favored in the brief years of our history in being able to command the services not only of the science teachers of the state, but of many of the foremost science teachers and investigators of the country. Our scientific friends have been more than generous in this respect. They have come to us from the older East and from the younger, if not more active and enterprising West, and have contributed each in his way to the promotion and success of the work of the Science Teachers Association.

Without further multiplying words, I may simply say that you are welcome to Syracuse University and to the medical department, under whose roof we are housed today. It is now my pleasant privilege and honor to introduce to you the president-elect, Dr Franklin W. Barrows of the Buffalo High School.

Dr Franklin W. Barrows—*Mr Chairman, Ladies and Gentlemen:* I am sure that the small attendance at this opening meeting need not discourage us in any way, for the fact that we have accepted the hospitality of Syracuse University is a good omen. Our meetings in Syracuse have always been satisfactory and enthusiastic. You, Dr Hargitt, and the university are assured that we feel at home with you and in your city. It is both fortunate and unfortunate that there are two associations meeting here at the same time which demand the attention and interest of our members. The reason that we have not more at this opening session is because a number of our members are in the meeting of the associated principals and some of them are taking part in the program.

We are fortunate this year in that we have been able to make some progress in the work for which the association was organized. Two committees are working on important topics. A committee of seven are at work on the subject of earth science and the suggestion of courses of study. The committee on stimulants and narcotics, five members under Prof. Bishop, reports its progress tomorrow afternoon.

It is not necessary to inform those who have looked over our program that for this session the papers have been selected with the central idea of suggesting the proper preparation and training of science teachers. The program has somewhat the appearance of sameness, in that the phrase "the training of teachers" appears in so many places in the announcements of the section meetings and of the general convention. This is no mistake nor oversight. The committee, the members of the council and the chairmen of the sections have striven to emphasize this matter more than ever before, and perhaps with the special view of being helpful to teachers in the secondary schools.

Without further remarks on the program or on the other features of the meeting, it gives me great pleasure to introduce to you a gentleman who, as a professor in the colleges of the state, has had as much to do as anyone with the equipment and training of science teachers. I have the pleasure of introducing Prof. Samuel J. Saunders of Hamilton college, who will address you on the "Value of research Work in the Training of the Science Teacher".

VALUE OF RESEARCH WORK IN THE TRAINING OF THE SCIENCE TEACHER

BY PROF. SAMUEL J. SAUNDERS, HAMILTON COLLEGE

We often hear the opinion expressed that the modern methods of education do not produce as good results as the old-fashioned ones. Is this true, or is it but the croak of the pessimist? Be that as it may, the questions and discussions at such gatherings as this make it evident that our modern methods are not yet entirely satisfactory. Is the fault in the choice of subjects, or in the teachers and their training? What do we mean by "good results"? What do we ask our teachers to do for us, and for our rising generation? These questions seem to bring us to a consideration of the best methods of education.

The test of every educational system is the product which it forms. It should produce men who think and decide for themselves, men of action, who make their mark in the world, who succeed in whatever they undertake, whether the problem be scientific or social. It should make of the average man an intelligent, clear-thinking, truth-loving and cultured citizen. The object of education is to expand and train the mental faculties, to teach people how to think for themselves; and *that* discipline is the most valuable which makes us the most self-reliant, and enables us to make the best use of our reason and judgment with respect to all matters pertaining to our own welfare and that of the community.

In that delightful book, *Helen's Babies*, the author strikes a chord which finds a response in every human breast, when he represents the three year old hero insisting that his uncle open his watch and let him "shee wheels go wound". For centuries that cry has gone up from the children of men. All are curious to peer into the machinery of the universe and learn if possible how and why the "wheels go round". There is a deep seated desire in every child to find out the reason of things, and this spirit of inquiry should be fostered and developed; it is one of the first essentials in research.

The work of the school should connect with the child's previous interests, and continue the educative process of the earliest years, which is always of the nature of original research. The excellence of science, as a means of teaching people how to think, is no longer questioned. Even with a view to culture, science, when properly taught, is one of the best means of educating the highest faculties of the human mind. By proper teaching we do not mean the mere learning of a lot of scientific facts, but discipline in the methods of science. Mere head knowledge may do a man very little good; it is the habit of mind and the training in method that determines the character of the man. As an instrument of human progress the greatest value of science is manifested in scientific inquiry, or research, and no amount of mere learning, or mechanical skill, can take its place. The progress in science and industry is due to the spirit of inquiry and inventiveness developed by research methods of training, and these methods should be applied throughout the whole educational course of every individual.

What do we mean by the research method? We may define it briefly as being, "The putting of related experiences together and finding things out for ourselves".

All education, which attains its highest ends, is of the nature of original research. In this sense, that is to say, of adding to our knowledge by our own efforts, we have all been, to a greater or less extent, engaged in research work since the moment of our birth, and there is no period in life when the research method is more accurately and successfully applied than during our early years. The young child learns the meaning of a word, tone, look, or action, by putting together various instances of its occurrence, forming a conception of its significance, testing the correctness of this conception by repeated observations and modifying it as experience widens.

As we grow older, and are able to understand the answers and explanations of others, our power of applying the research method seems to fall off rapidly. The ease with which we can then obtain information by asking questions does away with the necessity for much mental effort on our part, and we gradually cease to investigate for ourselves, this power dying away with disuse like any other power. Moreover, we fall into the habit of appealing to, and relying on, authority. The child should be placed under such conditions that his desire for the acquisition of knowledge can be kept alive and fostered, and so that he does not lose the habit of systematically searching for truth by the aid of known truths, and testing the validity of each step by constant reference to experience and experiment.

It is important that this power of applying the research method, this acquiring of science-forming ideas, should be raised to as high a pitch of efficiency as possible before we stand face to face with the problems of life. It becomes more and more difficult to begin to apply this method as we advance in years. It is unwise then to postpone its cultivation till we have entered on the special duties of our life work. It should be cultivated, as we have said, during the whole school career from the kindergarten up.

Much of our modern education fails because many subjects, even the sciences, are learned as the dates of important events in history are learned; the memory alone is exercised, reason and judgment do not come into operation, unless it be merely to refer matters to some authority which is considered final. It fails too because the pupil is not trained to apply his knowledge. It is by constantly making practical use of the knowledge we possess that the power of making original application of knowledge is best brought out. The pupil should test his knowledge continuously, and learn "to do by doing". In language study he should translate from one language to the other till he has acquired readiness and facility in the process; in mathematics he must work problems, and in the sciences he must prove his theories by experiment. He should use his knowledge and reasoning with respect to some phenomenon, and then test his ideas by experiment. The result usually shows him that his preconceived opinions must be modified, or perhaps wholly abandoned; that there are laws which must be discovered by patient labor and investigation. He realizes also, that he must be constantly on his guard against errors, that he must become acquainted with the sources of these errors and learn to fulfil the conditions necessary to avoid them. He may be able to learn a great deal about the truths and principles of science, and their experimental illustrations, by reading about them in a good textbook; he learns more, if in addition to the reading he can see the experimental illustrations and demonstrations performed by another; but he learns most and best by doing them himself. There is nothing that brings the truth home to the mind so well as experimental proofs carefully carried out for one's self. The possession of knowledge does not confer on a man the ability to use it, and the possession is of no value if it can not be used and applied. If our one talent is to gain other 10 talents, it must not be buried in the earth. The research method means simply the using of the knowledge we have, to gain more. For the student, for every one, whatever his profession or calling, there is but one thing essential to success—he must acquire knowledge, and the power to search out knowledge for himself through his own experiences. The man of business must have not only a knowledge of things, but also of principles and methods, and his success is proportional to the skill with which he applies such knowledge. He must note carefully the satisfaction or discontent of his customers, put his experiences together and learn from them general rules, which he makes more and more accurate as time goes on.

That knowledge which we have acquired by serious thinking and hard work we are apt to value and remember; it becomes, at least, a more secure possession than that which has been easily and lazily gathered while enjoying a cigar and fan. The difficulty of a book, or subject, is not in itself an objection to its use in education, for to learn how to overcome difficulties is a very valuable part of the training. Mathematics are hard, and Greek is hard, and that is one of the reasons why they are such excellent educational subjects. In the present day, however, when there is so much to learn, we are always on the lookout for the royal road, and even when we have done our best to smooth the way, there is considerable difficulty left.

Language study furnishes abundant opportunity for the application of the research method; it involves the continual putting together of the known to arrive at a knowledge of the unknown; a constant modification of, and addition to, our ideas of the meanings and usages of words and phrases, as experience widens. In these studies too much help is often furnished the student. There are grammars and dictionaries giving all the shades of meaning, and minute details regarding the make-up and use of the different words and phrases; there are also the annotated texts furnishing additional notes, and helps over the hard places, to say nothing of the interlinear and literal translations better known as "cribs", "ponies" or "horses".

The sciences are often taught as if the object of the study was simply the acquirement of a store of useful information, and there are epitomes of the latest results in each branch of science which the student can read and memorize. There is nothing of the research method in this, it calls for no original application of knowledge already possessed, no drawing on experience, none of the mental faculties except the memory is exercised to any extent.

Even for the experimental work, there are elaborate manuals in which nearly everything is worked out for the student, and he is told just what to do and how to do it, and what he should expect to see. The work is merely a training in mechanical operations, not intellectual discipline. If he does not obtain the results indicated, he goes over the work again, he relies on authority and not on himself. It is a good thing for the beginner to verify for himself well established laws, and to cultivate manipulative skill and dexterity, but experimental work should also cause the student to observe and think for himself. The misuse of such helps may defeat the highest aims of the studies in which they are used.

Our modern system of education should stand out against the abuse of authority and memory. The lack of time, and the necessity of mastering a certain amount of information in which examinations have to be passed, are perhaps the main causes of these abuses. Examinations, as they are usually given, test only the memory, not the powers of reasoning and judgment.

Culture does not depend so much on the subjects, as on the method and persistence with which they are pursued. It is no argument against the study of the classics, that the proper study of science makes keen thinkers and able men, for the classics properly pursued will do the same; nor, on the other hand, is it any argument against the sciences that the classics have produced the profound thinkers and eminent scholars of the past. Who will ever know how many thousands there were, during the past centuries, who had no love for the study of classics or mathematics, and who had no opportunity to test the educative power of other studies?

The boys in schools used to be divided, I believe, into classical boys, mathematical boys, and good for nothing boys, this last division existing chiefly because their intellectual blades required a different process of sharpening from the others.

It is estimated that about 2% of all boys are clever, and for a clever boy any subject of study is good enough, one perhaps as good as another, if it enables him to come into close mental contact with great thinkers. But what about work for the other 98%, the average boys and the dull boys? The study of the sciences proves to be the intellectual salvation of many of these. It arouses some minds which nothing else seems to reach, and it develops and trains in all cases faculties which otherwise would have remained dormant.

Progress is always greater when the work is pleasant, and there are so many ways of study offered by the sciences that one has a chance to select that which is most attractive for him, and instruction from the teacher need not change or hinder his own natural method of study. Some branches are almost purely observational; but if he prefers abstract reasoning he takes up the mathematical side; or if he loves to make apparatus and use it he approaches the subject on the experimental side.

A twofold advantage is claimed by the advocates of science studies; first, that they are a means of the best mental training, and second, that they communicate a kind of knowledge which is of practical use in everyday life. It has been said that the teaching which limits the range of a man's vision to the subjects and facts of which he can see the use does not deserve the name of education, the very essence of which is the strengthening of the intellect by mental exercise. But in these days of fierce competition in the industrial world, we must study more and more those truths and principles of abstract science which lie nearest the useful. There are many problems in nature the solution of which would confer great material benefits on mankind in general, and in which the processes and methods involved in carrying them to a successful conclusion, are identical with those which the problems of pure science require, while the discipline and training imparted are equally good. I am not encouraging the idea that utilitarianism should be made the end and aim of education, but what is the advantage of making a close study of the planet Mars, for instance, its markings, its climate and its physical conditions when we know little or nothing of the composition of the earth's crust, or of water, or air or the glass in our windows, or what the nature of the light is that shines through them? The widest culture is the noblest culture. Universality and thoroughness may go together, but why do we so often go far afield for subjects for investigation and study, when there is much that is just as good near at hand, and perhaps more likely to prove useful in everyday life?

There is a kind of knowledge that is actually becoming a necessity. It is that knowledge which best unlocks nature's storehouse, and enables us to wrest from her more than has ever been obtained before, that knowledge which will enable us to find out and use powers of nature which have never been used before. The great success of Germany in commerce and manufactures is due to the particular attention paid to the physical sciences. Sooner or later knowledge and method and industry must tell. Dr Lockyer, the English astronomer, said recently in an address, "I look upon scientific education as a great and necessary line of defense for our country, perhaps scarcely secondary to our naval and military forces."

The connection between scientific and technical education is a close one. In the laboratories new discoveries are constantly being made, science makes known to us new properties and qualities of matter and mechanical invention applies these discoveries to industrial processes. A thorough training in abstract science is a necessary groundwork for a technical education, for how can one understand the practical applications of a science unless he is familiar with the underlying principles of that science? To specialize without the proper preparation is like building the top story of the house first; when it is completed you have but a one story house, and it sits on the ground.

The applied science of the future is now in the process of formation in the operations of those who are working in pure chemistry and physics. Thousands of investigators are patiently working in the laboratories in all parts of the world to bring out new knowledge, and each year now witnesses more discoveries than a century used to. A renowned painter was once asked which he regarded as his greatest painting; he answered "The one I am about to paint". The greatest discovery in science is "The one that is about to be made". The best teaching inspires the student with the conviction that he also can work out new truths, and make some permanent additions to human knowledge.

A scientific man, as such, is valuable according to the amount of new knowledge he is able to bring out, or if he is not engaged directly in research, according to the number and ability of the workers which he prepares and equips for the bringing out of new knowledge. We lead in the struggle for commercial supremacy among the nations of the world, partly because of our great natural resources, but largely because we have such a good supply of investigators and well trained managers, and workmen competent to take instant advantage of every discovery in science. We must maintain, or even increase, the number and efficiency of such men, and must afford them the facilities for acquiring the necessary scientific knowledge and training. The investigators and managers perhaps receive their training in the universities or technical schools, but the workmen, who should be sufficiently well trained to take the initiative whenever necessary, must depend entirely on what they receive in the public and high schools. If in these schools they are taught to understand and apply the best known general principles they will be able, later, to master a given set of practical details with readiness and facility. To the science teachers then belongs in a large measure, the task of preparing all these, so far as education is concerned, for their work in life.

Every teacher who teaches science thoroughly is training skilled teachers for the rising generation. He should have not only a thorough knowledge of his subject, but the ability to impart that knowledge to others, and the willingness to do his utmost.

It is, of course, indispensably necessary that he should be well grounded in his work, and should have a thorough comprehension of the methods and principles of his branch of science, but there is for the teacher even though a specialist a great value in general culture. The man of broad culture and refinement seems to impress his ideas on the pupil's mind in a way that makes them stick. The teacher who knows his special subject well, but not much in other lines has difficulty in doing this. The twofold caution so often given by Bacon against overgeneralization on the one hand, and against overspecialization on the other is still as deserving as ever of the attention of mankind.

A man, in climbing to the peak of a mountain, meets with many difficulties, but experiences pleasure in overcoming them and in enjoying as he rises a wider and more commanding view of things beneath him. If now he wishes to guide others to the top, he must come down again to the valley, put himself in close touch with those to be guided, perhaps even roping himself fast to them, and lead them by the way which he took, cutting steps and footholds in the difficult places, and being always ready to cheer and support the drooping and exhausted. He would accomplish nothing by declaiming from the top, however eloquently he might describe the beautiful scene spread out around him, or however vigorously he might shout his directions as to the proper path to take.

Happiness has been defined as "The state of satisfaction engendered by success in surmounting the material difficulties of life". For a clear and vigorous mind it is a source of intense pleasure to master new ideas. The best progress in study is made for the sake of that reward alone. It must have been this pleasure of overcoming the difficult, the love of truth for truth's sake, that led to the researches of the old Greek geometers, for it was not till the time of Galileo and Kepler that the knowledge of conic sections was of the slightest practical use to science; but they built better than they knew, for it is safe to say, that without their contributions there would have been no Kepler, without Kepler no Newton, and without Newton no such conception of nature as we now have, of nature which is subject in its every phenomenon to exact and definite laws.

A recent writer says that science is ever seeking to write in pure symbols, hence it is not comparable with what we understand by literary work. Some of the grandest truths may be presented to the mind by means of pure symbols.

There are truths which can not well be expressed in any other way. It is said that Newton after waiting for years to secure accurate data was so overpowered by emotion, as he neared the end of his calculations, that he was unable to finish them, but called another to do so for him. Yet what Newton saw was a few pure symbols, a simple arithmetical expression. But that simple expression revealed to him the fact that every particle of matter attracts and is attracted by every other in the universe. He was thrilled by emotions which language is powerless to express or describe. Have you ever gazed on a scene of such grandeur and magnificence that you realized that language was perfectly inadequate, that you could not even attempt a description of your feelings? Then you may understand what he felt.

Speaking now more specially concerning the value of research work proper, we might consider first, the perceptive faculties. One of the first things the student in scientific research must do, is to learn to use his eyes. He must be an accurate observer of the various objects and phenomena with which he is concerned. A great deal of our knowledge, if we are to profit by the labors of others in the same field, must come from books, but we should insist that the learner be taught to observe for himself before he appeals to the experience of others. The ancients seem to have been particularly deficient in the power of observing. They gave much attention to astronomy but they record the number of fixed stars visible to the naked eye as 1600, while we now give the number as nearly 4000. We also give about 20 as the number of nebulae and star clusters visible in our latitudes, while Hipparchus gives two and Ptolemy but five, both of them omitting such remarkable objects as the nebulae in Orion and Andromeda. The constellation of the Pleiads was considered of great importance for navigation and was constantly observed and yet only seven of its stars were discovered. In fact the seventh one was lost sight of for centuries, and ultimately when the middle star in the tail of the Great Bear first attracted attention, the conclusion arrived at was that it was the missing seventh star of the Pleiads. Nowadays cases are known of people who are not astronomers seeing from 14 to 16 stars in the Pleiads, and it is by no means uncommon for people of good sight to see 11. The star Alpha Capricornus has been seen by man for thousands of years without its being noted that it is a double, a fact that any child would discover now, if its attention were directed to the star. It would be interesting to know in how far we inherit a trained eye from generations of ancestors who gradually accustomed themselves to the accurate observation of objects.

In addition to training his perceptive faculties, the student in research must exercise his reasoning powers to work out and understand his observations, systemize them, and compare them with others. In science we are much more concerned with the quantitative relations than with the qualitative, and as our knowledge increases that part of it which is mathematical also increases and becomes in many cases quite difficult. In planning and conducting operations in research work there is abundant opportunity for the development of the constructive imagination, originality of mind, and inventiveness. He must change his apparatus and appliances to meet the requirements of the problem in hand, or perhaps devise and construct new pieces as he amends his processes. Patient industry and self-denial, which are the first conditions of scientific investigations, develop self-reliance, and impart strength and solidity to character. With what wonderful patience and perseverance did Kepler work! For 22 years he read the face of the starlit heavens, tracing and measuring with patient exactness the positions and paths of his celestial wanderers, before he was able to deduce from his results the laws of their motion. Every notable scientific achievement rests on a long continued series of patient observations.

Research work calls into active play the powers of the imagination. A noted critic has said that the two men whose imaginations were the most brilliant of any of their day were Michael Faraday and Charles Darwin. All the phenomena with which the scientific investigator deals are concerned with the actions of the invisible and unseen on the visible. There are force, energy, electricity, the universal ether, and many other such subjects or conceptions to consider and explain or describe, and the imagination is often unequal to the tasks imposed on it.

A French bishop, who had become greatly troubled over the nebular hypothesis, or the six literal days of *Genesis*, or something of that sort, preached a sermon in which he inveighed fiercely against science and scientific men, with a repetition of that condemnatory vigor which landed Galileo in prison. At the close of the service a noted astronomer went up to him and said "Monseigneur have you never seen God?" "No," said the surprised bishop "I never have." "Then, your grace, I have" was the reply. "I have seen him in the great cathedral of the universe, I have felt him in the movements of creation, I have witnessed his workings from nebula to star and from star to planet, I have read those scriptures of the sky which you have not, I have touched his robe and know him as a visible being."

In research work our ideas are of value only so far as they are true. Perfect frankness and truthfulness of mind are indispensable to success. Each new problem must be approached with the mind open for the reception of new truth, and all preconceived opinions must be laid aside or held subject to revision. It often requires the utmost skill and attention to sift the truth from the error. One must be careful and accurate both in measurements and statements. Extreme accuracy often leads to valuable discoveries. The discovery of the aberration of light would not have been made if Bradley had not been able to measure accurately to one one hundredth of 1¢. To the fact that Rayleigh was not content to allow the small discrepancy of one part in 10,000 to pass unnoticed, the discovery of argon is due.

Scientific investigation trains in mechanical operations, in manual dexterity and manipulative skill. There is constant adjusting and handling of apparatus, and many operations which are apparently easy, require a deftness and accuracy of touch which comes only from practice. Research work strengthens the memory, for the investigator must remember a large number of facts, and their mutual relations. It brings home to the mind of the investigator the fact that he must stand entirely on his own merits. Credentials, certificates and diplomas avail him nothing. He realizes that they are no more than the stamp on a coin, which makes it a counterfeit unless the metal itself be genuine. Last, research is one of the most vital factors in the promotion of civilization, one of the most powerful levers of national prosperity and influence. Time will not allow, if indeed it were necessary, to call attention to the wonderful discoveries of even the past decade. And yet how many of us think of the latest discovery as if it were really the very last that can be made. Research will never proclaim any proud period and her work accomplished, it grows from more to more. The good ship Discovery is well under way, and the ocean of triumphant progress in unbounded.

Prof. C. W. Hargitt—I hope everybody will not wait for everybody else to say a word on this very fruitful topic and on the very admirable presentation to which we have listened. Every proposition made, it seems to me, must appeal to all and to some measure become inspirational. Some of us who listened to the address last evening by Pres. Draper concerning the primary duty of the teacher to impart some measure of inspiration, have had brought anew to us this morning the same idea, and I think the reader of this paper has made clear to us that it is not primarily the work of science to afford information alone, but it seems to me that he has made it clear that inspiration is one of its primary ends, and I feel that in so far as the science teacher may fail in that primary end of his work, he fails in his work. What we need is not simply the acquisition of knowledge, of mechanical skill or of technical ability so much as the capacity to inspire the boys and the girls, and whether teachers in the schools or in the higher departments of university or college work, it seems to me that one of the primary aims in science work is to inspire.

Such papers and ideals as these which this association has taken pains to emphasize are among the most hopeful signs of the times. Let us have done with the idea that the aim and end of science is knowledge or skill or even the ability to earn a livelihood, but that it is to open the mind, to remove the scales from blind eyes, to compel deaf ears to hear, to open anew to the rising generation the avenues through which the world of nature around us appeals to us.

Prof. A. J. Grout—At the risk perhaps of anticipating some things I planned to say this afternoon, I want at this time to propose a question which seems to be of vital importance, because there are a number of people here I will not be able to reach this afternoon.

To my mind the greatest obstacle to science teachers doing just the kind of work suggested is the tryanny of examinations, college, Regents, or whatever you call them. Suppose you teach by research methods in the secondary schools, what will it profit you on examination day? And our students must pass the examinations or the work is discredited. The examination of today, as I see it, is a test of cyclopedic knowledge, and I want to suggest one thing now, can not the Science Teachers Association do something to make our examinations not a hindrance but a help along these lines of work?

Inspector Arthur G. Clement—I wish to express my appreciation of the valuable paper presented. It seems to have touched on the fundamental principle which ought to inspire all science teachers, to get the students to discover facts for themselves and not take everything for granted and learn merely from textbooks. We are apt to think that research work is only for people who have studied a long time and who have made some great discoveries and are still endeavoring to make further research.

I think the speaker brought out the point well that even young students are doing research work, provided they take things at firsthand and work out their ideas before looking into the textbooks. I have read somewhere that very many great discoveries have been the result of accident, but it is to be noted that these supposed accidents never occur to people not attempting to do research work. Those doing research work frequently make a discovery other than what they are looking for. Therefore we ought always to encourage students, as they may discover something of great value in the scientific world, though not the truth for which they were seeking.

The last speaker spoke of the tyranny of Regents examinations. As I happen to be in the employ of the Regents, I wish to say just a word and to insist that there is no such tyranny when the examinations are properly used. For instance the examinations given in physics or botany. It can hardly be called tyrannic to ask a student 15 questions, of which only eight are required to be answered, specially when 15 questions cover quite a range of matter. If the student has done the work it is a very easy matter to sit down and write out answers to eight of them.

Dr Grout—I want to say for myself that I never personally suffered from that tyranny—that those questions in that science are not tyrannic, but can not questions be devised to test the students' power to do the work? Of course most of the questions have to be, under the present system, a test knowledge of the facts. I want to see questions which test the students' ability to do the work, and where a school is equipped with a laboratory, it is practicable.

Inspector Clement—I must insist that the questions are all right. When we ask the student to write out an account of an excursion he has made with the class, dwelling on the observations he has made pertaining to geology or physical geography it is certainly a fair question and gives a chance for a person to tell what he knows. This is simply an illustration.

Prof. Franklin N. Jewett—I am in sympathy with the writer of the paper. I have asked pupils, which they preferred in doing experimental work, to know the result in advance or to discover it, and I have been surprised, not quite dismayed, but surprised and interested at finding that a great majority preferred to know the result in advance. They said that then they liked to work better. I simply know that students are capable of doing fine work under that plan. They are greatly interested and do extra work in the laboratory, and come in after school and work till dark on a process which usually tells what to expect, striving to find the answer as we did in arithmetic when the answer was under the problem and not in the back of the book.

This has not convinced me, however, that the report is to be taken at par. I am not convinced that the sense or experience on which these pupils based their reply was entirely normal or best, but I present the matter and want to know if anyone can tell me how general this impression may be among the pupils; how it takes and how it works. I can not get the conviction out of my mind that the proper way is the way of discovery, and I have always wished in later years that I might have had more opportunities for such discovery when younger.

I have also thought—I presume there is no question about it as everybody knows it—that the scientific world is getting its information by reading more than by the laboratory. If I am wrong I would like to be corrected. No people more than scientific people get together and hear each others papers read. That is literary work, textbook work. A man goes through a process, a series of experiments, and his reports are printed and become common property of the scientific world. This feature has its place, as marking humanity and distinguishing it from the lower animals. Where has it a place, in the beginning of school life? When should it come in in large measure? These, to me, practical questions, I do not mention with the expectation of having them entirely settled. There are two sides to the matter and I do not wish to limit either side unduly. I hope to make more observations on this subject.

The question arises how far shall we push conclusions beyond experiments. I must confess I would like to see the experiment tried of teaching some of the sciences to persons who should have no textbooks and no access to textbooks. If any have had such experience, I would be glad to hear from them.

Prof. George M. Turner—I like Prof. Saunders's use of the term "research work". I confess that it has never appealed to me quite as it has this morning. I have always felt that a teacher in a high school was not quite in the position where he could do original work, as a professor in college could. I am willing to grant that I have experienced, and no doubt many others in this room have experienced, such feelings as described, that one might have on finding something new to themselves, not to the world, but to themselves.

The use of the term is a good one. From this standpoint, why do not the boys and the girls do research work every time they go into the laboratory? The work and results are in most cases discoveries from their standpoint. The previous gentleman remarks that he thinks his pupils are more inclined to have the answer given before the work than afterward. In many cases I think that is all right. Why not? The pupil does not go into the laboratory, as I understand it, for the purpose of discovering the laws. He is not there for that purpose. He goes there to win the power to use his hands, to train his mind and to draw proper conclusions from what he has done. Why should not the pupil, knowing beforehand what to look for, use his hands just as well? Knowing where and how to look, why should he not have this same satisfaction when he has gotten something new to himself, that the research man has when he finds something new to the world as a whole?

From a personal standpoint, I never shall forget the first time I went into a dark room to develop a plate and brought out an image produced by an x-ray. I had read about the thing. It was not new to the world, but it was decidedly new to me. It was some three or four months after the discovery was announced that I had an opportunity of trying the experiment. A boy had a bullet in his hand which the doctor asked me to locate. I had no faith that I could help the man, but I exposed for that bullet something like one and one half hours. When I took the plate into the dark room it was with a strange kind of a feeling, and when I saw the outline of the hand, and afterward that of the bullet, I can not put it into words how I felt. I just felt a certain degree of enthusiasm, gladness and joy beyond expression. Why should not our boys and girls, even if they have an idea what to expect, enjoy the work and get out of it the same degree of satisfaction that I had, or those have who do entirely original work?

Prof. N. A. Harvey—I have been very much interested in the discussion and very much pleased with the paper itself. There is one idea in the paper that leads me in a direction that I am very glad to go—the use of the term research to mean not the extension of knowledge that the world already possesses, but the extension of the pupil's own knowledge after the manner that research workers employ. Generally we think of research as being that kind of work which extends the limits of knowledge possessed by the world. I do not know that this use of the term research is above criticism. After all, it carries with it an implication that is very good. It seems to me the only true method. Perhaps it has to come to high school work through that word so common and familiar to us, as applied to workers in universities and great original investigators.

It seems to me it is the only way in which we can do the best work for our pupils in the teaching of science. It is not sufficient for a pupil to work for a known result, as that will not afford the greatest advantage to the pupil.

You know how great the influence of expectation is on an anticipated result. When a person is working with a chemical balance, and the operations are not very delicate and he knows he ought to get a certain number of grams and milligrams for a particular amount of substance he has been working with, it is almost impossible to keep that balance from working out the known amount. It shows that result every time. So in operations for measuring falling bodies, if a person knows he ought to get about a specified amount, he can not prevent it coming right to that point. It will come in spite of himself, and he may be as honest as he pleases. It is that influence which is so disastrous to good work. I have no doubt that a great majority of pupils would prefer to know what they would get. I think if the teacher should put it to a vote, "Now, shall we read this Latin lesson with a pony, or read it without?" I think I know how that class would decide. It would be a very remarkable pupil who would take the other stand conscientiously. There are pupils who, in geometry, will work out demonstrations in an original way and not get help, but most will not do so. They are not remarkable. They are common, everyday people like the rest of us. Not many of us will work out a problem at firsthand. We wish to economize time and effort.

I will say this in answer to a gentleman over there. I have had some experience in doing this in work with classes in physics and in chemistry and in zoology particularly, and I might say in botany, where my effort was to an extent that I thought necessary, directed to keeping reference books, textbooks and answers out of the hands of the pupils. The results were eminently satisfactory to me, and I think, to the pupils. I do not know that they enjoyed it more than they would the other way, but they just took it as a matter of course because it had to be that way. There was a very great difference in the kind of work done from that done where a textbook was put into the hands of the pupils. I have in another place presented this instance as an example of a general principle. It is the clearest evidence I know of. For three successive years I taught two classes a day in physics in a normal school, in which the students had had different experiences before entering the school. One was a class of high school graduates, all the members of which had studied Avery's *Physics* and had various experience in laboratories. Laboratories had not been of the same kind. Some were good and some bad, and perhaps some had not done laboratory work. The other class had never studied physics. The two classes were taught in the same studies, with the same experiments in laboratory, and the same teacher. There was the best possible opportunity for comparison, where every other variation was eliminated, it seemed to me, except the one of previous different experience. In a part of the work the experiments and exercises were just as new to those who had studied physics as to those who had never studied it, but this seemed to make no difference whatever. I very soon found that those who had not studied physics before had a better result than those who had studied, and in seven cases out of 10, the class who had never studied physics, obtained more nearly accurate results on the average, than those who had studied it. The textbooks were kept away from the students who had studied physics before, yet they certainly had a knowledge of what some of the answers should be. The only interpretation I could make was that the teaching of physics to those pupils with a textbook in hand had detracted from their ability to obtain correct results by their own original observation at firsthand. Proof of the same fact would be more difficult to obtain in botany and zoology.

It seems to me the paper has stated the profoundest principle of pedagogy in teaching physics. I don't know very much what good we are going to get out of it, if not that.

I would like to ask the gentleman who spoke about examinations, what kind of examinations to give. I am very much interested on both sides. I happen to be teaching classes that undergo examinations. I happen also to be on the examining committee for Chicago which examines applicants for entrance to the normal school, for principals certificates and for high school teachers, and the committee has debated seriously for the past six weeks, twice a week, what kind of an examination to give. The difficult thing is how to test the power; the results that accrue from laboratory work and which could not be obtained from textbooks. Last June 385 were examined for entrance to the normal schools. When the number is smaller we can take them into the laboratory.

Inspector Clement—I don't know that I can answer the question better than to suggest one or two questions. Suppose we wish to test the pupil's power to observe. Let the student take any flower he chooses, but state in good English how some flower he has studied carefully is able to prevent self-pollination. If he were given a flower he had not observed it might be tyrannic, but let him have a choice. I think that is fair.

Prof. Grout—I don't want to crowd myself on the association, but I want to give just my idea, that I may not be misunderstood. Mr Clement's statements are right as far as they go. The larger part of the examinations still test the memory. Take the question of the flower's self-pollination. What will prevent the child having that drilled into him? Give him a flower and let him tell how it is pollinated.

I realize the laboratory difficulty. What is there in it? It may be difficult but in so far as it is possible, it is my idea of an examination.

Prof. Samuel J. Saunders—I think it will work very well with older ones, but not with children 14 or 15 years old. There is not time to think it out. It will not work with young people in their teens.

Prof. Albro D. Morrill—In teaching biology, I try not to make the examinations wholly examinations in memory, to test not what he knows, but what he can do; to give the pupil a flower which he has not seen and ask him to describe it. I make the memory part of it shorter on the count, give no directions, but simply ask him to make a complete description of it. In some cases I have had very fine results, but not in all. I think I am testing what the pupil can do, and would mark him low for not being able to do.

Prof. Grout—I have tested that in examinations; you have to make the examinations shorter.

Prof. Harvey—The contention is that the student should do his very best work all the time. His results should be the best that he can get. It may be that he has obtained a totally wrong result. That will be corrected and revised when the work is reviewed by the class as a whole with the teacher. The average result of all the members in the class will come pretty near the truth, near enough to indicate the laws.

Prof. Saunders—It came to me when the gentlemen were discussing the values of different methods, one thinking the result should be known and others, that it should not be, the statement that I have seen made that Prof. Tyndall once called Faraday into his laboratory to show him some experiment in polarized light. As he was about to proceed Faraday stopped him and asked what he was to look for. Even this prince of experimenters thought it would be a help to him to know what he was to look for.

In the x-ray experiment spoken of by Prof. Turner of Buffalo, he knew what to expect and what to look for if all the steps were right. The joy came from the fact that all the steps were taken properly.

I think on the other side, answers should be, as far as possible, kept away from the students. I incline to that method. Keep away results entirely till after going through the process, and then compare them with and look through those of others.

Friday afternoon

GENERAL SESSION

THE STUDY OF TYPES

ITS SIGNIFICANCE AND ITS APPLICATION

PROF. N. A. HARVEY, CHICAGO (ILL.) NORMAL SCHOOL

I assume as the basis of this discussion that the teaching considered in this paper is educational in its nature rather than professional. I mean by this that it shall be for the ultimate purpose of training the mind to do better the things that all minds can do in some degree rather than to accumulate a fund of information to be used in the practice of a profession. The psychologic movement of the learner rather than the logical development of the subject is the thing that is of the first importance, and is the chief factor in determining the method to be employed.

Permit me to state also, that in all my illustrations I have had in mind the teaching of science in high schools. If the teaching of scientific subjects in colleges and professional schools were to be considered, the illustrations and the basic propositions would need very considerable modifications.

The greatest contribution of science to education is the scientific method. The scientific method is not a method of teaching, but it is a method of thought, and is capable of universal application. It is called the scientific method because it has been developed chiefly in scientific subjects by scientific men. Its importance is so great and so fully recognized that we are continually finding the scientific method applied to subjects formerly considered most remote from scientific facts.

In its essential features, the scientific method proceeds in an orderly way from the study of an individual to related individuals. By a comparison of the resemblances and differences existing among individuals, the concept of a class is formed, and thereafter related individuals are grouped into the classes previously formed. By this process we are compelled to recognize the logical sequence and the relative significance of each before we can classify it.

It will be seen that in the scientific method of study, the individual is the first thing to be considered. From this fact the scientific method is sometimes regarded as an example of induction. In reality the scientific method is quite as much deductive as it is inductive, but the starting point is the same as in a case of pure induction. This individual which is taken as the starting point may be called a type, since it always embodies the characteristics of the group that is founded on it. A type, however, may mean much more than the individual that is studied. It necessarily involves all the characters that enter into the concept of the class, but it should be one that contains the average characters of the class. Individuals of the same kind are not all alike; variations occur that make them individuals. These variations are quantitative in their nature, and in some individuals are much greater than they are in others. In any group of individuals that are combined into a class, there will always be extremes of variation and an average point or norm from which variations occur. In the vicinity of this norm will be found the greater number of individuals that constitute the class. It is this average, this point of departure, this possessor of the common characters in the least variable degree that may stand for the type of the class. It will be seen that the selection of an individual to stand as the type of a group is a matter demanding considerable care. It would be very unwise to select as the type for study one of the most aberrant or divergent forms in the group.

It is evident that the selection of an individual to stand as a type will depend on what it typifies. An individual is not a type unless it stands in the mind for a class, or stands as the representative of a group, all of which have common characteristics.

We come at once, then, to classification as an element in scientific study. Classification is implied in almost every operation of the mind above the simplest. It is implied in every act of judgment. Whenever we use a common noun we make use of classification or its result. Every catalogue, every index, every table of contents, the arrangement of our houses and streets attests the necessity we feel for classifying objects. It is a universal process of thought and is common to all human minds. It is this process of classification that constitutes science and makes possible scientific knowledge.

Classification of a series of objects is the actual or the ideal arrangement of those that are alike together, and the separation of those that are unlike. It enables us to do two things. First, it enables us to retain in mind the characters of many objects at once, as well as to infer from things known unknown correlative properties. It is a labor-saving process. It conserves mental effort and this economy of mental effort is perhaps the most important principle in education. It is the thing that largely constitutes the difference between a mind of great power and one of little power.

But classification does more than this. Classification discloses to us the correlations or laws of union of properties and circumstances. It is only when we make a proper classification that these laws appear. We are inclined to think that for every series of objects there is one system of classification that is best, and which we call the natural system, and much energy is devoted to the discovery of that system. The so called natural system of classification in animals and plants is a genealogic system intended to show the relationship by descent of the individuals classified. It discloses the general law of descent and the kinship existing among the different animals and plants. This system is not yet complete, as we do not know enough about animals and plants to adjust them satisfactorily in their places. But there is no question that the arrangement of organized beings in the natural system of classification has been productive of the greatest good in the development of our scientific knowledge, and in disclosing some of the most important and far-reaching truths.

But the natural system of classification is not the only one that may be used to advantage, nor the only one that is still employed in classifying animals and plants. Other systems of classification disclose other laws than those of descent. We still have and still need the classification of geographic regions, of temperature zones, of life habits, of geologic horizons, of physiologic functions. Each of these classifications is necessary and will always be used because each discloses natural laws that constitute an essential part of scientific knowledge.

I think I do not overestimate the importance of the study of classification as an element in education. There are certain elements of dynamic thought involved in classification that are positively fundamental. Somewhere in the life of a student there must be a place where the processes and methods of classification are consciously worked out. If this can be done in one or two subjects, the principle of classification can be applied to other subjects, and be used as a tool to make further acquisitions of power in other directions.

Botany and zoology are the classificatory sciences *par excellence*. Here the principles of classification have been worked out with a fulness of detail observed in no other subjects. Here if anywhere the student must get his knowledge of those principles. In my opinion, botany and zoology must rest their claims for introduction into a course of study largely on the fact that they are classificatory sciences. Any attempt to substitute some other element than classification as a basis for the work in these subjects, is to discard an element of greater importance for one of a less.

I am not unmindful of the fact that both subjects include many departments in which the element of classification is not at all the conspicuous process. Such are the departments of physiology, histology, cytology, paleontology, embryology and ecology. Each of these may be taken as the basis of knowledge of animals and plants. My contention is that in an elementary course, where the purpose is purely educational, it is highly injudicious to make anything but taxonomy the basis of the work. The other departments are tributary to this and should be so recognized. They are highly specialized departments, and can scarcely be studied in their full significance without some knowledge of the taxonomic relations of the forms used as types. I would take taxonomy as the basis and group around it the essential features of all the other departments, not by any means omit them.

This digression on classification started from the statement that the selection of a type depends on what it typifies. In botany and zoology we have classified groups of different rank, rising through the series of individual, species, genus, family, order, class, branch and kingdom, each with many subdivisions. In beginning zoology, some teachers prefer to begin the subject by studying a grasshopper, crawfish or snail. Others looking to the logical development of the subject, prefer to begin with a protozoon: a paramoecium or amoeba. The reason for the latter preference is that the amoeba is a simpler animal. Looking at it from the standpoint of the pupil who is beginning the subject, it seems to me to be not so. To the pupil the grasshopper is the simpler animal. Smallness is not an evidence of simplicity. To the pupil the grasshopper is the simpler form, because it is more nearly related to the things with which he is already familiar. He is familiar with his own body and organs and their way of acting. The grasshopper has legs and it moves. It breathes and eats. In fact it does many things that he himself can do, and in so far is closely related to himself. It is nearly enough like himself to cause him to feel the similarity and yet sufficiently different to enable him to state wherein the difference exists.

The same thing can not be said of the amoeba. The pupil has no body of related knowledge that can be used in its study, but it stands alone and unconnected in his mind. The development of the subject from the amoeba as a type, does not follow the historical development of the subject, and though this is not necessarily the best method of procedure unless the historical development of the subject follows the psychologic development of the pupil, this latter is likely to be the case and the historical development of the subject is likely to indicate a logical and psychologic method of introducing the pupil to the subject under consideration.

There are many advantages in beginning the study with an insect or crustacean, such as convenient size, its economic importance, etc. But I have introduced this example to show that all such considerations mentioned really have little weight in deciding on the selection of a preliminary type. We must answer to ourselves of what it shall be a type. A complete scheme of systematic study would lead us to select a type of a species, a type of a genus, a type of a family, a type of an order, a type of a class, a type of a branch and a type of a kingdom. The logical sequence and relative significance of these groups can be determined only if our first animal studied shall serve successively as the type of each. By this process we begin with the individual as an individual and rise by successive generalizations through the less extensive groups to the all-inclusive group of animal kingdom. I know of no one who will undertake, with a high school class, to use an amoeba as a type of a species, a genus, a family, an order, or even a class. It is generally used as a type of animal that is of a kingdom, thus beginning with the most extensive group and proceeding in a deductive order to less extensive, or not obtaining from the subject the content that I should suggest as one of the most important things to be obtained from it, viz, a knowledge of the principles of classification and the full significance of type study.

Besides this, we must decide what an individual shall be a type of before we can decide what characters are of sufficient importance to demand the attention of the learner. An animal or whatever it may be, is at first only an individual, and as such has some thousands of characteristics of which no one will be rash enough to undertake to make a complete catalogue. Different writers of laboratory guides will cause a pupil to see

different numbers of these characteristics, some more and some fewer. A college student will be called on to see 50, and a pupil in the grammar grade to see only five. But on what basis is the number of characteristics to be observed determined? There is scarcely more value in seeing 50 than in seeing five unless the characters to be observed are selected with a reasonable and sufficient end in view. To add to the observation of nonsignificant characters the observation of other nonsignificant characters is an unnecessary waste of energy. They will never become significant.

If we study the grasshopper as the type of a species, we shall notice the carinae, the fovea, and various other things that discriminate one species from another. If it is to be used as a type of a genus, we shall necessarily notice the generic characters: the subgenital plate, the fastigium of the vertex, the prosternal spine and all the other marks by which systematists distinguish one genus from another. In a complete scheme of type study, it seems to me that there might properly be this minute discrimination of characters till the idea of the less extensive groups has been built up.

If our grasshopper is to be used as the type of a family, we shall be called on to see the various family characteristics: the wings, the legs, the ovipositor, and the shape of the body. If it is to be used as the type of an order, we shall notice the ordinal characteristics: the mouth parts, the kind of wings, the metamorphosis. If it is to be used as the type of a class, we must observe the class characters: the body divisions, the number of antennae, the kind of skeleton. If we make it the type of a branch, we must observe the things that separate the branch Arthropoda from the other branches, while if we are to use it as a type of the animal kingdom, it will be necessary to observe independently the things in which all animals agree and in which they differ from all other created beings.

I trust it will be seen that we have here a means and a reason for deciding on the particular characters that are to be observed by the pupil who is put into our char[illegible]eason for direct-

ing him to such study as will lead him to see these things rather than to see others will not be apparent to the pupil, and I am sorry to suspect that it is not always apparent to the teacher as well. But it is our duty to find the reason for doing as we do or not do it.

I have stated now what a type is, and the principles that shall govern both our selection of the type and the characters to be observed in the study of each. My second proposition is that different things selected as types should be related to each other in such a way that the comprehension of the relations shall not be too difficult for the learner. The types must not be too widely separated from each other and the related forms must be studied. If this is not done there is little value in the study of a type. All thinking consists largely in the perception of relations between things. So numerous and so diverse are the relations existing in the universe that we may say that education consists largely in training the mind to perceive relations. Any mind can perceive some of the most evident relations, but the mind of the greatest philosopher is incapable of recognizing some of those that exist. In order to train the mind to perceive relations, it must be set to perceiving them, and the difficulties must be graded according to the capacity of the mind to be taught. It is in the proper gradation of difficulties that teachers are likely to make mistakes, specially in the teaching of science whose pedagogics is so insufficiently worked out. We have no adequate statement, so far as I have been able to find, of the psychology of laboratory science, and no serious attempt has been made to frame a course of study in science in terms of the psychologic movement of the learner. Our books of method in science are books of devices, or methods in the most limited sense.

Returning to our example of the grasshopper, we have observed the characters that we shall use in studying other animals. We are then ready to take up the study of a related animal. Ordinarily we seek for the type of a family rather than the type of a species or a genus. By a comparison of the repre-

different numbers of these characteristics, some more and some fewer. A college student will be called on to see 50, and a pupil in the grammar grade to see only five. But on what basis is the number of characteristics to be observed determined? There is scarcely more value in seeing 50 than in seeing five unless the characters to be observed are selected with a reasonable and sufficient end in view. To add to the observation of nonsignificant characters the observation of other nonsignificant characters is an unnecessary waste of energy. They will never become significant.

If we study the grasshopper as the type of a species, we shall notice the carinae, the fovea, and various other things that discriminate one species from another. If it is to be used as a type of a genus, we shall necessarily notice the generic characters: the subgenital plate, the fastigium of the vertex, the prosternal spine and all the other marks by which systematists distinguish one genus from another. In a complete scheme of type study, it seems to me that there might properly be this minute discrimination of characters till the idea of the less extensive groups has been built up.

If our grasshopper is to be used as the type of a family, we shall be called on to see the various family characteristics: the wings, the legs, the ovipositor, and the shape of the body. If it is to be used as the type of an order, we shall notice the ordinal characteristics: the mouth parts, the kind of wings, the metamorphosis. If it is to be used as the type of a class, we must observe the class characters: the body divisions, the number of antennae, the kind of skeleton. If we make it the type of a branch, we must observe the things that separate the branch Arthropoda from the other branches, while if we are to use it as a type of the animal kingdom, it will be necessary to observe independently the things in which all animals agree and in which they differ from all other created beings.

I trust it will be seen that we have here a means and a reason for deciding on the particular characters that are to be observed by the pupil who is put into our charge. The reason for direct-

ing him to such study as will lead him to see these things rather than to see others will not be apparent to the pupil, and I am sorry to suspect that it is not always apparent to the teacher as well. But it is our duty to find the reason for doing as we do or not do it.

I have stated now what a type is, and the principles that shall govern both our selection of the type and the characters to be observed in the study of each. My second proposition is that different things selected as types should be related to each other in such a way that the comprehension of the relations shall not be too difficult for the learner. The types must not be too widely separated from each other and the related forms must be studied. If this is not done there is little value in the study of a type. All thinking consists largely in the perception of relations between things. So numerous and so diverse are the relations existing in the universe that we may say that education consists largely in training the mind to perceive relations. Any mind can perceive some of the most evident relations, but the mind of the greatest philosopher is incapable of recognizing some of those that exist. In order to train the mind to perceive relations, it must be set to perceiving them, and the difficulties must be graded according to the capacity of the mind to be taught. It is in the proper gradation of difficulties that teachers are likely to make mistakes, specially in the teaching of science whose pedagogics is so insufficiently worked out. We have no adequate statement, so far as I have been able to find, of the psychology of laboratory science, and no serious attempt has been made to frame a course of study in science in terms of the psychologic movement of the learner. Our books of method in science are books of devices, or methods in the most limited sense.

Returning to our example of the grasshopper, we have observed the characters that we shall use in studying other animals. We are then ready to take up the study of a related animal. Ordinarily we seek for the type of a family rather than the type of a species or a genus. By a comparison of the repre-

different numbers of these characteristics, some more and some fewer. A college student will be called on to see 50, and a pupil in the grammar grade to see only five. But on what basis is the number of characteristics to be observed determined? There is scarcely more value in seeing 50 than in seeing five unless the characters to be observed are selected with a reasonable and sufficient end in view. To add to the observation of nonsignificant characters the observation of other nonsignificant characters is an unnecessary waste of energy. They will never become significant.

If we study the grasshopper as the type of a species, we shall notice the carinae, the fovea, and various other things that discriminate one species from another. If it is to be used as a type of a genus, we shall necessarily notice the generic characters: the subgenital plate, the fastigium of the vertex, the prosternal spine and all the other marks by which systematists distinguish one genus from another. In a complete scheme of type study, it seems to me that there might properly be this minute discrimination of characters till the idea of the less extensive groups has been built up.

If our grasshopper is to be used as the type of a family, we shall be called on to see the various family characteristics: the wings, the legs, the ovipositor, and the shape of the body. If it is to be used as the type of an order, we shall notice the ordinal characteristics: the mouth parts, the kind of wings, the metamorphosis. If it is to be used as the type of a class, we must observe the class characters: the body divisions, the number of antennae, the kind of skeleton. If we make it the type of a branch, we must observe the things that separate the branch Arthropoda from the other branches, while if we are to use it as a type of the animal kingdom, it will be necessary to observe independently the things in which all animals agree and in which they differ from all other created beings.

I trust it will be seen that we have here a means and a reason for deciding on the particular characters that are to be observed by the pupil who is put into our charge. The reason for direct-

ing him to such study as will lead him to see these things rather than to see others will not be apparent to the pupil, and I am sorry to suspect that it is not always apparent to the teacher as well. But it is our duty to find the reason for doing as we do or not do it.

I have stated now what a type is, and the principles that shall govern both our selection of the type and the characters to be observed in the study of each. My second proposition is that different things selected as types should be related to each other in such a way that the comprehension of the relations shall not be too difficult for the learner. The types must not be too widely separated from each other and the related forms must be studied. If this is not done there is little value in the study of a type. All thinking consists largely in the perception of relations between things. So numerous and so diverse are the relations existing in the universe that we may say that education consists largely in training the mind to perceive relations. Any mind can perceive some of the most evident relations, but the mind of the greatest philosopher is incapable of recognizing some of those that exist. In order to train the mind to perceive relations, it must be set to perceiving them, and the difficulties must be graded according to the capacity of the mind to be taught. It is in the proper gradation of difficulties that teachers are likely to make mistakes, specially in the teaching of science whose pedagogics is so insufficiently worked out. We have no adequate statement, so far as I have been able to find, of the psychology of laboratory science, and no serious attempt has been made to frame a course of study in science in terms of the psychologic movement of the learner. Our books of method in science are books of devices, or methods in the most limited sense.

Returning to our example of the grasshopper, we have observed the characters that we shall use in studying other animals. We are then ready to take up the study of a related animal. Ordinarily we seek for the type of a family rather than the type of a species or a genus. By a comparison of the repre-

different numbers of these characteristics, some more and some fewer. A college student will be called on to see 50, and a pupil in the grammar grade to see only five. But on what basis is the number of characteristics to be observed determined? There is scarcely more value in seeing 50 than in seeing five unless the characters to be observed are selected with a reasonable and sufficient end in view. To add to the observation of nonsignificant characters the observation of other nonsignificant characters is an unnecessary waste of energy. They will never become significant.

If we study the grasshopper as the type of a species, we shall notice the carinae, the fovea, and various other things that discriminate one species from another. If it is to be used as a type of a genus, we shall necessarily notice the generic characters: the subgenital plate, the fastigium of the vertex, the prosternal spine and all the other marks by which systematists distinguish one genus from another. In a complete scheme of type study, it seems to me that there might properly be this minute discrimination of characters till the idea of the less extensive groups has been built up.

If our grasshopper is to be used as the type of a family, we shall be called on to see the various family characteristics: the wings, the legs, the ovipositor, and the shape of the body. If it is to be used as the type of an order, we shall notice the ordinal characteristics: the mouth parts, the kind of wings, the metamorphosis. If it is to be used as the type of a class, we must observe the class characters: the body divisions, the number of antennae, the kind of skeleton. If we make it the type of a branch, we must observe the things that separate the branch Arthropoda from the other branches, while if we are to use it as a type of the animal kingdom, it will be necessary to observe independently the things in which all animals agree and in which they differ from all other created beings.

I trust it will be seen that we have here a means and a reason for deciding on the particular characters that are to be observed by the pupil who is put into our charge. The reason for direct-

ing him to such study as will lead him to see these things rather than to see others will not be apparent to the pupil, and I am sorry to suspect that it is not always apparent to the teacher as well. But it is our duty to find the reason for doing as we do or not do it.

I have stated now what a type is, and the principles that shall govern both our selection of the type and the characters to be observed in the study of each. My second proposition is that different things selected as types should be related to each other in such a way that the comprehension of the relations shall not be too difficult for the learner. The types must not be too widely separated from each other and the related forms must be studied. If this is not done there is little value in the study of a type. All thinking consists largely in the perception of relations between things. So numerous and so diverse are the relations existing in the universe that we may say that education consists largely in training the mind to perceive relations. Any mind can perceive some of the most evident relations, but the mind of the greatest philosopher is incapable of recognizing some of those that exist. In order to train the mind to perceive relations, it must be set to perceiving them, and the difficulties must be graded according to the capacity of the mind to be taught. It is in the proper gradation of difficulties that teachers are likely to make mistakes, specially in the teaching of science whose pedagogics is so insufficiently worked out. We have no adequate statement, so far as I have been able to find, of the psychology of laboratory science, and no serious attempt has been made to frame a course of study in science in terms of the psychologic movement of the learner. Our books of method in science are books of devices, or methods in the most limited sense.

Returning to our example of the grasshopper, we have observed the characters that we shall use in studying other animals. We are then ready to take up the study of a related animal. Ordinarily we seek for the type of a family rather than the type of a species or a genus. By a comparison of the repre-

different numbers of these characteristics, some more and some fewer. A college student will be called on to see 50, and a pupil in the grammar grade to see only five. But on what basis is the number of characteristics to be observed determined? There is scarcely more value in seeing 50 than in seeing five unless the characters to be observed are selected with a reasonable and sufficient end in view. To add to the observation of nonsignificant characters the observation of other nonsignificant characters is an unnecessary waste of energy. They will never become significant.

If we study the grasshopper as the type of a species, we shall notice the carinae, the fovea, and various other things that discriminate one species from another. If it is to be used as a type of a genus, we shall necessarily notice the generic characters: the subgenital plate, the fastigium of the vertex, the prosternal spine and all the other marks by which systematists distinguish one genus from another. In a complete scheme of type study, it seems to me that there might properly be this minute discrimination of characters till the idea of the less extensive groups has been built up.

If our grasshopper is to be used as the type of a family, we shall be called on to see the various family characteristics: the wings, the legs, the ovipositor, and the shape of the body. If it is to be used as the type of an order, we shall notice the ordinal characteristics: the mouth parts, the kind of wings, the metamorphosis. If it is to be used as the type of a class, we must observe the class characters: the body divisions, the number of antennae, the kind of skeleton. If we make it the type of a branch, we must observe the things that separate the branch Arthropoda from the other branches, while if we are to use it as a type of the animal kingdom, it will be necessary to observe independently the things in which all animals agree and in which they differ from all other created beings.

I trust it will be seen that we have here a means and a reason for deciding on the particular characters that are to be observed by the pupil who is put into our charge. The reason for direct-

ing him to such study as will lead him to see these things rather than to see others will not be apparent to the pupil, and I am sorry to suspect that it is not always apparent to the teacher as well. But it is our duty to find the reason for doing as we do or not do it.

I have stated now what a type is, and the principles that shall govern both our selection of the type and the characters to be observed in the study of each. My second proposition is that different things selected as types should be related to each other in such a way that the comprehension of the relations shall not be too difficult for the learner. The types must not be too widely separated from each other and the related forms must be studied. If this is not done there is little value in the study of a type. All thinking consists largely in the perception of relations between things. So numerous and so diverse are the relations existing in the universe that we may say that education consists largely in training the mind to perceive relations. Any mind can perceive some of the most evident relations, but the mind of the greatest philosopher is incapable of recognizing some of those that exist. In order to train the mind to perceive relations, it must be set to perceiving them, and the difficulties must be graded according to the capacity of the mind to be taught. It is in the proper gradation of difficulties that teachers are likely to make mistakes, specially in the teaching of science whose pedagogics is so insufficiently worked out. We have no adequate statement, so far as I have been able to find, of the psychology of laboratory science, and no serious attempt has been made to frame a course of study in science in terms of the psychologic movement of the learner. Our books of method in science are books of devices, or methods in the most limited sense.

Returning to our example of the grasshopper, we have observed the characters that we shall use in studying other animals. We are then ready to take up the study of a related animal. Ordinarily we seek for the type of a family rather than the type of a species or a genus. By a comparison of the repre-

sentatives of different families that are closely related, we can generalize from a statement of their resemblances and differences, and rise to the concept of a larger and more extensive group. Families that are alike make up an order, so we can obtain the concept of an order from a comparison of the types of families. Next we select types of orders and so rise to the concept of a group of higher rank, in which different characters are employed, and are thus seen to be of deeper significance. In a similar way we can obtain in succession an idea of a class, a branch, and a kingdom. If we wish to go into more minute discriminations, we shall be able to reach the conception of each one of the 21 divisions that have been used to designate the successive including groups employed to express the relationships and sequence of animals.

In all this work, our first type may be used as the type of each successive group of increasingly greater extension, for our observations originally included all the characters of the successive types. Successive generalizations separate the table of characters into an increasingly larger table of differences and a decreasingly smaller table of resemblances between the animal first studied and representatives of the more extensive groups. Finally our entire table of characteristics will be seen to be distributed into the successive tables of differences. This process has enabled the teacher to cause the mind of the learner to move in such a way that the relations of the different animals studied have been clearly seen. The mind has been compelled to discriminate, compare, and generalize. Our selection of types has led to this result.

I would not have it understood that we study only the dead forms instead of the living beings, as is sometimes charged against this kind of work. The living activities are just as much a character of the type as the morphologic structures. But the dead body of a beetle is a living thing in the sense that every part has been produced by the life of the animal, and had some function in the life that the animal lived. We study the legs because the animal moves with them; the wings because he flies with them; the mouth parts because he bites with them. And so it is with every part; each part has some meaning in the life of the animal and it is the object of study to interpret that meaning.

Just here I should like to pause long enough to comment on the value that exists in systematic work in botany and zoology. It is a kind of work that has of late fallen very much into disfavor, and very properly, too, in consequence of the great abuse to which it has been subjected. The marks that are used to discriminate genera and species are apparently so trivial that they seem ludicrous. I would merely suggest that the variation in physiologic function and life habits is usually much more pronounced than it is in the morphologic structures. But the differences in morphologic structures can be quantitatively stated and used to discriminate species. Even among individuals of the same species such variations in personality exist that we need to study many individuals of the same species in order to obtain an insight into the psychology of the mind of the species. Also, I would suggest that all the most delicate work of the embryologist, the histologist, the ecologist, everybody who contributes to the knowledge we possess of an individual of a particular species, only helps us to arrive at a better understanding of the relationships that exist among the various groups of animals and plants, which is precisely the thing that the systematist attempts to do in a rough and ready way.

My third proposition is that the study of types is necessary for the purpose of economizing effort. This is merely a corollary to our discussion of classification. I doubt if there is a more important principle in education than the one indicated by the phrase, economy of effort. I believe that it can be shown that the essential difference between the great intellect and the common one is embodied in the phrase, economy of effort, and that the most important mental processes are those that most efficiently conserve mental work.

A type from its nature stands for a class. Everything that we may predicate of the type as distinguished from the individual, we may predicate of the class. We need not then examine all the members of the class in order to know what its properties are. Type study is a substitute for perfect induction, and while it has serious limitations, its advantages are very great in the economy of effort. The great extension of knowledge in every direction has necessitated a development of some method of using it. Otherwise it becomes unwieldy and a student is overwhelmed by its very profusion. Type study is the method by which this great wealth of knowledge can be acquired and made available for service.

The idea of a group that will include the various individuals studied is obtained by a comparison of their properties and selecting from the entire number those in which the individuals agree. The concept of the more extensive group is obtained by observing the resemblances that exist among the types of the less extensive groups. This process is called generalization, and is of essential importance. In fact, most of the other operations of the mind may be regarded a tributary to this one function. It necessitates a good many preliminary operations: abstraction, analysis, discrimination and comparison.

The perception of resemblances is a more difficult process than the perception of differences and manifests a higher order of thought. There are acute minds that have in a marked degree the power to see differences, but whose ability to see resemblances is exceedingly limited. In order to generalize we must often see a logical identity existing in objects that on first examination appear to be wholly unlike. Paradoxes are fused into a unity, and things that seem to be so diverse as to render the assertion of their identity absurd, are seen to be essentially the same.

Every mind must generalize, and has the power so to do. But the differences in this power possessed by different individuals are very great. It is a power that can be exercised safely only with much caution and after long training. Every great advance in thought has followed a wider and more far-reaching generalization. Those who are capable of making such generalizations are the philosophers and leaders of thought. In natural science we are taught consciously how generalizations are made and the necessary cautions to be employed. Science, then, is the great training ground for those who generalize, and from the ranks of scientific men, or those trained in scientific methods, the philosophers of the future are sure to come.

In the collection of material, the mind becomes buried under a mass of details. We must select out of this mass particular things that we can examine fully, and generalize from them. The selected forms are types, and their inspection is necessary to enable us to generalize.

My fourth proposition is derived from the third. Economy of effort is obtained by comparing the second type studied with the first. It will be remembered in our previous illustration that the elementary type, or the first form studied, was examined as an individual. There is no economy of effort if the second type is studied *de novo* in the same way. It must be studied by comparison with the first. Ordinarily, its individual characters need not be noticed, but only the specific and generic characters. That is, the characters that are like or unlike those selected for study in the first.

The former practice in beginning the study of botany was to learn lessons from Gray's *Botany*, and after they had been well memorized, then to go to the flowers and apply to them the names of the parts that we had learned in the lessons. That is the way that I began the study of botany. While I have a profound respect for Gray's *Botany*, I have not so much for the teachers who used it in that way. They failed entirely to grasp the significance of type study.

Suppose that we decide that it is a proper part of botany to study flower structure. If one of the buttercups is available, it will serve well as a type. A short time will suffice to fix the fundamental characters of this flower. The evening primrose in the next lesson will embody the same essential elements of flower structure with modifications, the most important of which is the fact that the ovary is compound. The compound ovary is about the only thing in the flower that must be learned new, and this is learned because it is a difference from the type form of flower previously studied. A study of the jimson weed will introduce us to the monopetalous corol; a clover to the papilionaceous corol, the diadelphous stamens, and the clustered head. Other ideas in flower structure can be simply exemplified by a proper selection of types, so that 10 lessons treated in the most economical way will give the student a better idea of flower structure and plant morphology than we obtained in three months in the old way.

It was formerly the custom, now happily abandoned, in studying flowers to have a series of blank forms with many descriptive words, and the pupil was expected to underscore the words that fitted the flower he had in hand. You will see that in this process each flower was studied by the same pattern that the first one was, so that there was no economy of mental effort, though there might be a saving of ink in consequence of not having to write the descriptive words.

By the use of properly selected type forms, it is easily possible to study a dozen related individuals with no more effort than it took to study the one used as the original type, and do it as well. I have often observed that a class in the first year of a high school course will learn as much about a cricket, see just as many characteristics and see them just as well in two days as they saw on the first specimen studied, a beetle or a grasshopper, in five weeks. A common explanation by unthoughtful persons is that the powers of observation are cultivated by the study of natural science to such an extent that they have become able to see more in a given time. The power of observation as a reason for studying natural science has been so much overworked that I always feel suspicious of either the knowledge or the sincerity of anyone who gives that as a reason why natural science should be studied. The power to observe comes largely from the related facts previously known.

My fifth proposition is that type study is almost universal in its application. It is a conspicuous feature of the scientific method, and is capable of application with all its advantages wherever the scientific method can be applied. I have been using illustrations drawn from the classificatory sciences, but it is now being applied to geography in the series of books of which our friend Dr McMurry is one of the scholarly authors. In sociology my friend Mr Thurston is enthusiastically using it as a great improvement over the former method. In literature we see the same thing in progress. Everywhere we see the same tendency manifested. In fact, type study is not a thing just newly discovered. It is a very natural thing and has been employed deliberately many years. It is only recently that we have awakened to its full significance and have begun to inquire into its real merits and to study the laws that determine its use.

There is one other consideration that ought to be noticed. Type study presupposes that an individual is the center of correlation for all the characters that pertain to it. Now suppose that we had all the observed characters of one type written in a vertical column under the name of the type. Beside it we have the name of another individual or type with all its characters written under its name. Similarly suppose that we have the observed characters of several or many types written under their respective heads. Now shall we study our tables vertically or horizontally? Shall we make the type individual the center of correlation or shall one character expressed in the table be the basis of our study? Shall we study how the bumblebee lives and moves and has its being, what organs it works with and what kind of a creature it is, or shall we study how animals defend themselves and notice the bumblebee's sting as a defensive organ? The latter practice is directly opposed to type study. The advantages of type study are so pronounced that I have no hesitation in saying that the individual ought to be made the basis of study, but, in consequence of the natural disposition of people to run after strange gods, I believe that many people overlook its advantages and try to make an abstract principle the center of study. I grant you that these generalized principles must be known, but they become known so easily and with such great educational benefit when several types are studied and compared, that it seems to me a serious matter to abandon type study and make generalizations already worked out the basis. Such things are very well for newspaper science and cheap magazines and popular lectures, but they can never constitute the core of a scientific education.

Dr Grant Karr—*Mr Chairman, Ladies and Gentlemen:* We have listened with great interest to Mr Harvey's paper. I have enjoyed it to the extent that my knowledge would allow me to grasp it. I appreciate the fact that Mr Harvey is a specialist in his line, and this paper is one we will read with pleasure and profit hereafter. It seemed to me very difficult to get hold of it as he read it, and since I did not have an opportunity to read it and did not feel disposed to prepare a set paper and go off perhaps on a different line of thinking from that which Mr Harvey would take, my preparation is not very extensive, and what I have to say will be more in the line of suggestions, that have occurred to me and will pertain more to the teaching of science in grades below the high school, those being the ones with which I am most intimately acquainted.

The paper impressed most deeply some suggestions made this morning in the paper read by Prof. Saunders and its discussion. The first question which occurred to me was this: What is the relation of scientific knowledge to practical life? That is to say, what is science to do and why are we teaching science? Is the mere knowledge of scientific facts the end and aim of science teaching? That of course would bring up the whole discussion that arose this morning regarding examinations. There is a pretty well settled notion in the minds of many that an examination in any subject finishes it, and any preparation, in science or anything else, that would enable one to pass an examination, Regents or college entrance, suffices and that the passing of such examination *closes* the case.

Prof. Harvey in several places intimated that his solution of the question would be somewhat different; that he would have a knowledge given in science that is not of the sort that can be exhibited in answer to certain questions, a knowledge deeper than that, a knowledge that enters more deeply into the thinking, feeling and willing of a person, like the knowledge that was referred to this morning by the gentleman from Buffalo when he was first successful in making a photographic plate by means of x-ray, of a bullet that had lodged in a person's hand.

I would be glad if someone would discuss more fully and throw more light upon Prof. Harvey's treatment of this phase of the subject. It seems to me that the thought underlying his discussion more than anything else was that of the laboratory as a means of giving the student the requisite experience as a basis for thinking, doing and living. His first statement was that he wanted to call attention to those things which all people do, and which only the few do consciously and with a goodly degree of accuracy. The scientific method has come to stay and is a necessary part of the equipment of all who expect to understand the life and doings of the 20th century. The idea of evolution has come into the world and is influencing all sciences and all phases of life whatsoever, religion, literature, history and everything else. Someone has said that the two ideas of sociology and evolution are the two ideas by which we measure the present. They are the dominant ideas which define the present. Everything is filled up with these ideas. They are treated of in science and the scientific method is permeated with them so that one of the results of science teaching, as Prof. Harvey says, should be the acquisition of skill in the use of the scientific method.

What Prof. Harvey has said regarding the nature of classification strikes me as very excellent indeed. The nature of generalization and classification is best understood in this relation, types and type study being their less complete form, a sort of going from the less intricate into the more intricate and abstract ideas which the cut and dried statements of the science ratory will enable one to take on more of this external knowledge than the mere textbook, but yet it seems to me that the laboratory should be used to widen the whole experience of a person, to give him deeper insight into the life that he has lived and at the same time aid him to live a larger and fuller life. The laboratory is one of the most potent factors in the progress of the last one hundred years. But would it not be still more powerful if it were brought into closer relation to the other sciences and life itself? Are not the laboratories themselves too often satisfied with mere knowledge as a result? "Life is more than theology (theory) and the people know more than the preachers (whatever method they may have) teach," says Emerson. But this brings up the whole question of the subconscious in our life, and its understanding involves a full discussion of epistemology and its bearing on practical life.

Prof. C. W. Hargitt—I have been interested in the presentation of the paper, and while not caring to enter on its discussion at this time, thought, however, I should like to ask Prof. Harvey a few questions. I don't know that they would be profitable questions here, and yet they may: whether pedagogically speaking he should consider the type method of approaching the profounder or broader subject of taxonomy, indispensable in all grades of work. I suppose that if we were to speak of it from the high school standpoint alone, and I think that was his point of view largely, there might be some fair unanimity of thought. If we were to speak of it from the point of view of the grammar school teacher in the sort of work the grammar schools are able to do which we recognize under the head of nature study, might not something very different better serve the aim of science work, and when we come perhaps to pass into the more intricate problems of morphology and embryology in the college course, might there not be some differences of opinion, honest and serious, as to the type method? After all, it seems to me that more will depend on the individuality of the teacher than on the method. Let the teacher possess himself or herself of an ideal and a purpose and it makes less difference what the method may be. There may be very little of method in certain cases and yet admirable results. I thought this morning during a part of the discussion, when it was stated that an expectation of what was to be found in the dissection of animals gave zest to the dissection, that such was the method of no less distinguished a teacher than Huxley; and Huxley's introductory manual for laboratory study continued to be a type of laboratory method for nearly a generation. There has been some wide departure from that method of late, and yet the method that produced the results that were produced through that means is not to be despised. If, on the other hand, we take the other extreme and take Agassiz as its exponent, who, after handing a starfish to a student and letting him work at it, and asking him what he saw went off and let him look at it more, and so on for a day or a week, without a word of specific direction, that is another method.

We need only to refer to the products of the method in the men who have come from Agassiz's inspiration, as sufficient proof of its value. Whether the type method or some other method shall be used depends largely on the temperament and point of view of the teacher; and after all, the teacher is the motor in all this laboratory instruction and in all science work. Were it not so, let us use encyclopedias and textbooks and all that. They are a great deal cheaper than teachers; don't require much apparatus, nor care of apparatus. Let us turn them into encyclopedias and dispense with the live teacher. In the presence of the beginner, the child in the kindergarten, or in the grammar school, or even the boys and girls in the high schools there is something that is fundamentally important in life as it expresses itself, not only to see the form and structure of the thing, but how it acts, to move the leg or wing or jaws, to see it in its natural environment and doing the things that belong to it.

I do not know whether the association want to take time to discuss these questions suggested by the paper, but I would like to know, and perhaps the association would like to know, whether in these three or four grades of science work the type method is the necessary preliminary to all sorts of students.

Prof. N. A. Harvey—The second paragraph in my paper stated that it was written with high school work in mind. If other phases of the work were to be considered it would need considerable modification. This method of type study will be applicable only when the things desired to be obtained from the study are approximately something like what I have suggested here. I do not conceive that this is the purpose entirely nor very largely in nature study work, so called. The use of the term method, we sometimes think, implies some particular process of doing something. That is not the thought in my mind. My thought is that method is not something that can be patented, but that method depends on the content of the subject, the way you wish to make the mind of the child move. In certain schools and colleges, as I look at it, there is an entirely different purpose in view from that suggested. In professional schools particularly, the purpose is to obtain the largest possible amount of knowledge concerning the things that have to be used, in the shortest possible time. Books are used to the fullest extent. Books, lectures, laboratory, travel and anything that can conduce to the rapid acquisition of knowledge is to be used to the fullest extent. The college student in most cases is beyond the stage of developmental work that I have described here. He may be considered as having passed through a large part of the work. If not, he is a preparatory student and not a college student in the legitimate sense. He approaches the second phase of scientific study, which is largely a reading phase. He wishes to become familiar with what other people have said and done in the work engaging his attention. When a student reaches the limit of knowledge on the subject, learns to use his tools, knows what has been said and done with reference to his particular field of work, this little bit of the scientific world that he has mastered for himself, he proceeds into original research work and adds to the knowledge which the world possesses. That is the difference as I see it. The method depends entirely on the movement of the mind that the teacher or the instructor desires to have the pupil make.

Prof. A. P. Brigham—Not very long ago I heard one of our most eminent physiographers express the opinion that the time would come when we would get the land forms due to river action, for example, as fully classified as we classify the forms covered by the sciences of zoology and botany. I do not agree with that. I do not think the time will ever come, and I pity the teachers and students when it does come. I hold indeed that land forms are capable of a good measure of classification. Dr McMurry would tell us of his use of types in geography. I will make a suggestion or two. One form of the land is known as a mountain. How would you teach what a mountain is? No definition would cover mountain, so I am inclined to think we would have to begin with the study of types. We can not bring mountains into the schoolroom. If I could have my way, I would bring over the Jura as a type of folded mountains, not much worn, as the simplest type of the mountain form with its foldings, and see how these are made, and then compare the Appalachian, I mean in the narrower sense. I leave out the Adirondacks, as their structure is hypothetic; leave out the Green mountains, taking the simplest part of the Appalachian system as found in Pennsylvania. Then I would give a great deal of time in comparing the old and worn out Appalachians with the Jura.

If I were in Denver, I would begin with the great western system, taking the Rockies for a start. Teach the Rocky mountain structure as it is known. Go on to the Wasatch mountains or take the Sierras and Coast range, associating the plateaus with them. The order would not be very essential, but we can all see that, as we have passed from one mountain group to another, we should be saving time in all cases, and come out with some kind of a definition of mountains.

There would be other forms of the land, giving the same rational use of types. Let us take volcanos, beginning with

Vesuvius. That is as good as any. Learn all we can about it, and then we may take up almost any other in comparison, Etna for example. Then go over to Hawaii and note the differences in lava, form of cones and manner of eruption. Then pass to other types of volcanic activity.

I agree most heartily as to the great saving of time and energy, and on the idea that we come out with good general notions. I am very sure that our principles grow by using the type method in geography.

Prof. Harvey—*Mr Chairman:* I have had my say. I have made my speech. I do not know that I have anything further to add. I stated in the paper that the study of types is not new, but newly applied. I think it is being applied to the study of geology, as Prof. Brigham suggested, in a way that it has not been done before. No one has undertaken very long ago to study the forms of the land as type forms, nor to work out a typical land form. An examination of almost all the geographies at present used will show that they are studying type forms, instead of individual objects without relation to other individuals that may be grouped with them.

I think the study of types is coming to be used in a new sense from what it has ever been employed before. One thing I should like to say in addition, with reference to some remarks made by Prof. Karr. It may be well to state the relation of knowledge to what may be called discipline. It has been said that there is a contradiction in the two terms. I believe that there is no contradiction but a harmonious relation between them. It is clear to me that we may have the knowledge without having caused the mind to go through the processes that result in strength and power, and we may have it without any acquisition of power in the getting, but there can be no getting of power, training, discipline and improvement of the mind without a concurrent gaining of knowledge. An examination, if a teacher chooses to give it at the end of a term's work or the conclusion of a study, tests the knowledge. If the work has been properly done, the knowledge gained may be taken to measure the power that has been gained, though the knowledge and the power are not identical.

Knowledge may be tested without testing the power at all. The acquisition of knowledge necessarily accompanies the gain of power, but the gaining of knowledge does not imply that power is gained in the same process.

Prof. Hargitt—It may be of interest to the teachers of physiology to see some of the experimental work and the models illustrating the experimental work done with the first year students in physiology here. The laboratory is at the west end of this corridor, just opposite the head of the stairs, corresponding to this room, and tomorrow morning, between 9 and 10 o'clock, a demonstration will be made of heart action. Anyone interested in that work will be welcome to see the models and the experiments. They are rather ingeniously arranged, and very strikingly illustrative of certain processes which are not often seen.

Friday afternoon

SECTION MEETINGS

Section A. PHYSICS AND CHEMISTRY

PREPARATION AND TRAINING OF THE TEACHER OF PHYSICS

PROF. CHARLES B. THWING, SYRACUSE UNIVERSITY

There are, I believe, three classes of men engaged in teaching. First, those who are aiming at some other profession and are teaching as a temporary means of support. I presume that the number of this class engaged in teaching science is comparatively small, and that the number so employed who take sufficient interest in the broader aspects of the teacher's work present today is smaller still. I shall not have them specially in mind, therefore, in what I shall have to say.

A second class is comprised of those who have no special aptitude or preference for any other calling and have therefore taken up teaching. Their idea of teaching is somewhat like the coachman's notion of the episcopacy. "For a nice, clane, aisy job," said he, "give me bishop." I may say in passing for the benefit of visitors who may not be teachers, that the "job" of a successful physics teacher is neither clean nor easy. It means long hours, dirty hands, tired back and weary brain. But to him who loves his work it is a task full of pleasure and rich in rewards.

This leads me to the third class, which, I need hardly say, is composed of men who *could* do other things, profitably to themselves and acceptably to others, but who could hardly be contented anywhere else than in the teaching profession; men who are *called* to teach, called by their inclinations and aptitudes to begin, called by the loving appreciation of pupils and the commendation of principals to continue a work which they find, despite long hours and poor pay, brings them the consciousness that they are doing a work, quiet and unheralded though it be, the influence of which in molding the characters of the rising generation is second in importance to the work of no man, however prominent he may be in the public eye.

For the younger teachers present I shall try, in the time allotted me, to sketch in barest outline the ideal teacher of physics. In the discussion which follows this paper I trust the more experienced teachers will fill in some of the details of the picture till we see before us a composite portrait of the best science teachers we all have known. It will then remain for each of us to compare ourselves with our ideal and devote the remainder of our lives to completing our training and preparation for our chosen work.

The teacher of physics is first of all a man. His first concern for himself is that he may be a clean, honest, upright, manly man, whose interest in his students is not confined to the classroom but includes their sports and recreations, their home life and reading, their other studies and employments. He sees in each pupil, not primarily, one of a class to each of whom the same task is to be given, the same goal set, but an individual human soul, struggling with his own peculiar difficulties, often ignorant of his own needs and limitations, yet always open to help from the man wise and kind enough to see and show him his needs.

To the true teacher his subject is but one, perhaps his best, avenue of approach to the individual student's inner self. It often happens that the teacher's first real approach to the student must be along lines outside the subject taught. Every teacher will bear me out in the statement that he who has once found the way to a pupil's heart can teach him something about any subject which he himself has mastered, however long or deep seated the fancied dislike of the student for that subject may have been.

The youth retains to a large extent that insight which is so marked in young children. He knows his friends. No simulated interest in his affairs, no attempt on the part of the teacher to hide his own defects of scholarship or vices of character can long deceive the pupil. The man who hopes for permanent success by any but the most open, honest methods of dealing would better follow some employment which brings him into contact with grown men whose confidence in their judgment leads them to distrust their intuitions. He who probes men's souls like the surgeon who probes men's bodily wounds must have clean hands and instruments, or he will do more harm than good.

Second, the teacher of physics must have the same qualities which make the teacher of any other branch successful. He must be master of himself under the scrutiny of bright eyes, eager for knowledge or mischief, looking from the same bench with eyes whose attention must be caught and held till the sluggish, wandering thoughts are focused on some worthy object. All that any teacher needs of tact and skill and patience the physics teacher needs, and sometimes, when the apparatus goes wrong and the experiment falls flat, he is likely to feel that the humility of Moses coupled with the patience of Job would hardly be sufficient to preserve his equanimity.

The graces of tidy dress, a cheerful manner and a pure, clear English diction should be his, whatever effort it may cost to gain them.

Again the teacher of physics is a teacher of natural science, and the different sciences have relations with physics so close that it is impossible to ignore them. Indeed if the student has before studied and become interested in another science, the interest already aroused may be carried over to the new subject by an easy transition along the lines of contact between the two. If the teacher knows less of these kindred branches than the student knows, or thinks he knows, there is danger that the student will underrate the teacher's knowledge of physics. If, on the other hand, the teacher is fairly well at home in the other sciences, he can, by skillfully drawn illustrations, bridge the gap from the known to the unknown and lead the student to a firmer footing in the new territory.

I believe no mistake is more commonly or more often made by young teachers than what I may call, for lack of a better term, the error of abruptness. We plunge the student up to his eyes in a flood of new terms, new ideas, new methods of thought and then wonder that he gasps and flounders helplessly about instead of swimming easily to solid ground. We ought rather to conduct him to some point in his present groundwork of facts from which he may pass by easy stepping-stones across the boundaries of the new.

I am sorry for the teacher who is compelled to teach half a dozen sciences at once without time or adequate equipment for any one of them, and yet I am convinced that if the opportunity offered for the teacher who intended ultimately to teach physics to spend a year in teaching chemistry or biology or astronomy or physical geography it would be wise for him to embrace that opportunity and make the most of it. Physics is preeminently the broad or basal science. It now compasses the major part of what was once called natural philosophy and it is still the most general of the sciences.

If we think of natural science as one of the great natural divisions of human thought, physics occupies a mountain range and table-land near the center of that realm. In the foothills, well within the boundaries of physics, lies chemistry, in a territory which remained fairly well defined so long as the physicist kept himself strictly to masses and molecules and left the atom to the chemist. But of late years the chemist has been making incursions into physics till a neutral territory called physical chemistry has been formed. Still more recently the study of Röntgen rays, Lenard rays and kindred lines of investigation have compelled the physicist to believe that the atom is not, in reality the ultimate division of matter, but that the atom itself consists of thousands of smaller particles which Prof. J. J. Thomson calls corpuscles.

The physicist and chemist are, therefore, constantly crossing each other's territory, and he who is the trusty guide in physics must know at least the landmarks in the realm of chemistry.

The ultimate nature of matter, electricity, gravitation and the other forms of energy are the almost unexplored peaks which lie at the center of the field of physics.

Biology is a sunny land lying to southward. Its denizens trace back the streams of life to a point within the boundaries of physics and chemistry and leave us to track them still farther toward their ultimate source.

Geology overlaps with physics on the one side and biology on the other.

All of the sciences are debtors to physics for their instruments of research and all assume the fundamental laws of physics and chemistry for a working foundation, as physics in turn assumes the laws of mathematics. In view of the intimate relations which exist, therefore, between physics and the other sciences it behooves the teacher of physics both to include a study of these sciences in his general preparation for his work and to keep up as far as possible with the progress being constantly made in these subjects.

For the latter purpose I feel hopeful that a publication recently begun known as the *Current Encyclopedia*[1] would be of great value to every teacher. The science department of the *Literary Digest* is exceedingly helpful along these lines, though more popular in character than the first named publication. Both of these periodicals contain, of course, much other matter of interest in other lines than science which for the sake of general culture the teacher might profitably read.

---

[1] Modern Research Society, 153 La Salle st. Chicago.

I come now to a matter which may seem to some of you not quite germane to my subject. I am, however, unable to separate it in my own thinking or to keep it out of my daily teaching. I refer to the relations of science to theology. That any conflict has existed between science and religion I do not believe. I can not conceive how an increased knowledge of the laws of natural phenomena can in any wise diminish our reverence for the divine first cause, or lower our ideals of duty toward our fellow man. Indeed I think no thoughtful person ever contended that men of science are less reverent, less law-abiding or less abounding in good will and good deeds to their fellows than are other men.

Science has, however, attacked again and again certain beliefs which were so closely connected with religion in the teachings of the church and hence in the popular thought, that religious teachers took alarm and the truth was in danger of being lost to view in the smoke of noisy conflict. The field of battle shifted from geology when the old interpretation of the meaning of the days of creation had been abandoned to biology, which with the doctrine of evolution struck a stinging blow at the popular beliefs concerning the origin of man.

A question which it is to be hoped may be debated with less of acrimony than either of these because of a growing spirit of tolerance in both camps is the problem of the origin of life. That problem must find its solution, if the solution is found in physical science at all, in the realm of physics. At present the biologist is tracing back one vital phenomenon after another to the point where he can say, " It is explainable by purely physical or chemical processes." Suppose now it be found that the movements of the lower forms of animal life may be induced by electrical or chemical means, and do not necessarily argue an intelligent purpose on the part of the animal to seek its food, does the acceptance of this explanation preclude the necessity for a guiding intelligence in nature?

A recent case in point will illustrate my meaning. It is a well known fact of physics that, while the shape and position of a large body of liquid is determined chiefly by its own weight, the shape and movements of small drops and films are determined almost wholly by what is called capillarity or surface tension, the force which gives the raindrops and the soap bubble their spheric shape and causes the oil to rise in a lamp wick.

Now a German scientist has lately found that he can by whipping soap suds in oil produce a filmy froth which presents under the microscope the exact appearance of protoplasm, the physical basis of life. More wonderful still, this artificial protoplasm creeps and moves about and its individual cells contract and change their shapes and have currents of fluid circulating within them in a manner startlingly like the behavior of protoplasm itself. The so called "life" of the film is about 22 hours, after which it loses its power of motion and disintegrates.

What has the physicist to say in answer to the question, "Does surface tension explain the life of protoplasm?" To him the crucial point of the experiment is its end. The movements of the artificial protoplasm ceased when the energy imparted to it by the experimenter in the whipping process had been expended. It had no power to draw energy from its surroundings and so keep itself alive. If there is one law of more universal application than any other it is the law of minimum potential energy. In accordance with that law all spontaneous motion in dead matter is in that direction which will result in changing its condition from the less stable to the more stable. Water flows down hill, escaping steam expands, complex unstable chemical compounds, such as those formed under the influence of life, disintegrate or decay to stable compounds when left to the unhindered operation of physical forces. The heat of the sun itself is being radiated through space and the sun and all the planets must one day be as cold and lifeless as the moon is now. Nature, so far as physical and chemical laws can determine, is slowly but surely running down to a dead level of equilibrium. For the soap protoplasm there was nothing to do but die. It could not generate other soap protoplasm, nor even keep itself alive. It had no resources other than the mechanical laws of physics, and these, as we have seen, always lead to the same end.

But the plant protoplasm does otherwise, it draws energy from its surroundings and keeps itself alive. It generates other protoplasm like itself and builds up a living organism, differentiated in its different parts, employing the principle of division of labor as if working toward some definite end. It overcomes the chemical affinity of stable compounds in the soil and builds them up to highly complex unstable compounds. It overcomes the force of gravity and lifts a ton of wood a hundred feet into the air, building a tree which lives a century, surrounding itself meanwhile with a whole forest of trees which are, like itself, fighting against wind and flood and the subtle forces of decay. Whence has it the power to do all this? There must be something in or about or with the protoplasm that makes for progress in opposition to the inexorable laws of physics. The question " What is life?" remains unanswered, but the stream of life has been traced one stage nearer to its source with the result that the presumptions in favor of a purely materialistic origin of life are fewer today than at any time in the history of modern science.

But, someone asks, would you think it wise for the average teacher to speculate on these questions before his class? Possibly not; that is a question for each one to decide for himself. The average teacher will have young people in his classes who are thinking somewhat on these questions, thinking oftentimes with the deepest concern, for young people often take the deep questions of life more seriously than do their elders, and those same young people might be greatly helped by a thoughtful word spoken in private.

At all events one thing should be desired by the teacher above all others, both for himself and for his pupils, I mean the attitude of mind which places truth above everything else, that humble spirit which keeps the mind open to truth from every source, that spirit of reverence toward all truth which never scoffs at what it can not comprehend, nor willingly distorts the truth to gain a point in argument. The man who by patient thought and honest life has won his way to such an attitude of mind may never attain a wide grasp of philosophic problems himself, but among his pupils there will arise men whose thought will mold the forces of the world for good.

Last, the physics teacher is to teach physics, a task which requires for its successful fulfilment certain special aptitudes and habits of thought and a fairly definite technical equipment.

Physics is, at least in its possibilities, the most exact of the natural sciences. The phenomena studied admit of accurate measurement and are reducible to laws which may be expressed in mathematical symbols. The physics teacher should have or seek to acquire, therefore, the habit of accuracy of thought. This habit will show itself in speech by the employment of exact terms and by the frequent use of such qualifying words as "about" and "approximately." It shows itself too, in habits of promptness, order and neatness, and in manipulative skill, for the difference between a successful experiment and a failure depends oftentimes on a turn of the wrist, while the ability to give the wrist the right turn at the right moment tells of a habit of accuracy which has taken years to gain.

The physics teacher needs to have a taste for mechanics together with some practice in the use of tools. Few pieces of apparatus come from the maker in perfect adjustment and fewer still will stay in adjustment from year to year. The teacher who can use tools is rich with a very meager outfit if he can command a small fund from which to buy materials, while the clumsy teacher would be poorly off with a costly cabinet of apparatus at his disposal. The fundamental laws of physics are grounded in mechanics and find their illustrations in everyday machines. The teacher of physics should form the habit of noticing machines of all sorts and trying to understand how they work. I spoke near the outset of the opportunity afforded by the student's knowledge of other sciences to introduce him to the study of physics. It often happens, though, that the student has no such knowledge to help him. There are few boys, however, who do not have a working knowledge of some machine and most girls understand the working of the sewing machine at least.

A little broader field of observation and one which the teacher may cultivate with pleasure and profit all his life is found in the daily experiences of common life. A glass of water and a spoon at the dinner table afford illustrations of reflection, ordinary and total, magnified and diminished images by reflection, refraction, magnification by refraction, water waves, sound waves, and many other phenomena, while daily observations of the weather and of the varied out-of-door phenomena which daily crowd themselves on his notice will give the teacher a fund of facts for illustration such as no amount of reading could afford. I call to mind a drawing in a well known textbook of elementary physics which is intended to illustrate the apparent position as viewed by a person in air of an object under water. The man who drew the picture was an experienced teacher of physics, but neither he nor any one else ever saw the like of what he has there portrayed. There are two ways in which the teacher might have guarded against the possibility of making an error of this sort. One is the habit of observation just mentioned, the other is a study of the subject as treated in textbooks of a higher grade than that used in the class. Just here a word of caution is necessary. While advanced methods of treatment are valuable, I may say necessary, to the teacher for a thorough mastery of the subject, he must beware how he presents to his elementary classes any but the most elementary methods. The methods of trigonometry or calculus may appeal to the teacher by their clearness and simplicity, but to the student who has at best but a vague conception of geometry these are an unknown tongue.

The teacher should bring to the class the results of his study, not the steps by which he has reached them. Physics is strong food for babes. It must needs be predigested in the teacher's mind before it can be profitably offered to the pupil.

This work of mastering and simplifying the principles of so difficult a subject is the work of years, and it can not all be done before the teaching work is begun. Day after day, year after year, the teacher must modify and adapt his methods of presenting the subject till he has several good ways of explaining each point all at his tongue's end, and even then he will some day need to extemporize a new way in the presence of the class. It is for such emergencies, the propounding by the thoughtful, observing student of some question which seems never to have been asked before, that the teacher should be constantly trying to prepare.

If to all the qualities that I have suggested the teacher can add the ability for original research, he will bring to his class an added stimulus that nothing else can give. But here, too, let him beware lest he ride his hobby to the detriment of those who need a broad training in the subject as a whole, and a training which deals with the foundation principles of the science with such illustrations of those principles as will appeal to the student in his present state of knowledge so as to connect the facts presented with the facts already his, and thus to give him that toward which all education aims, the mastery of self in his manifold relations to the world in which he lives.

This is the end I have had in view while outlining the chief phases of the physics teacher's preparation for his work, which I may now, perhaps, best summarize in the inverse order of their presentation.

1 The physics teacher should endeavor to attain to as accurate and broad a mastery, both theoretic and practical, of physics itself as lies within his range of power and opportunity. This presupposes a corresponding mastery of mathematics and implies some skill in practical mechanics.

2 He should gain as wide a knowledge as possible of the related sciences, specially chemistry, and seek to find the salient points of contact of the other sciences with physics.

3 He should be a man among men, touching men at many points, helping and uplifting, always a man whose life embodies that strict conformity to the laws of being which his chosen science so perfectly exemplifies.

Prof. George M. Turner—Prof. Thwing's remarks about the tact needed in experimenting in physics are very true. It is sometimes a difficult problem for a teacher to gracefully get out of an experimental trouble. It requires a quick eye and a cool head to take advantage of a failure to have things go as they ought to go, and turn all toward success.

I recall two instances of experimentation apropos of this point. Some time ago I visited an evening's entertainment in which the instructor of the college had divided the work of presentation of the subject among the young men. Each had his prescribed part and was expected to make his explanation and experimentation fit with that of the young man preceding. The explanations were well learned and related how the experiment would work and what consequences would follow certain conditions. Unfortunately in many cases the experiments would not work and the consequences did not follow the young men's conditions. Very naturally the young men became decidedly embarrassed and matters became very much confused. Probably the audience suffered as much as did the chagrined young men.

Another time at a lecture the unexpected happened, but the tact of the experimenter turned failure into success. The Chinese ambassador had come over from Washington to visit the Johns Hopkins University. At this time Prof. Remsen was lecturing to his classes on hydrogen. By one of those unfortunate coincidences, the oxygen and hydrogen had mixed in the wrong place and a terrific explosion followed, wrecking much of the apparatus on the table.

The Chinese ambassador, thinking this part of the program, loudly applauded, while Prof. Remsen coolly bowed his acknowledgments of the appreciation, said "Thank you," and went on with his lecture as though nothing unusual had happened.

Prof. W. M. Booth—I would like to ask Prof. Thwing what he considers the minimum training in mathematics and physics for a properly prepared physics teacher.

Prof. Charles B. Thwing—He should get all the training he can get. I would not specialize in mathematics and physics to the neglect of the other sciences. Elementary mathematics he ought to take, then trigonometry. I do not know that he needs calculus with his other training. It ought to be possible to experiment in the language the student understands already.

The idea I had was, that every teacher should have had a full course in mathematics to do satisfactory work in a high school. Possibly some succeed without it, but some do not.

Inspector Charles N. Cobb—I was reminded during the delivery of this paper of a little incident which happened last summer. One sunny, sultry, Sunday afternoon, there came up to my front porch in Albany a gentleman of my acquaintance who came on some church business. He brought with him his son, a young man who had completed a year's postgraduate work in chemistry. After the excuse for the call had been cared for, he spoke of the fact that his son thought of teaching chemistry, and that he thought, also, of becoming a professional chemist. His father was so situated that he could go on with his work for several years without providing any income, and the young man said he thought he would like to teach chemistry, but he thought possibly it might become monotonous. He thought he might have to teach the same thing year after year and it would be monotonous. I suggested to him that he might be teaching the same thing year after year, but that he would not be teaching it to the same persons; that, however, if his object in teaching chemistry was not to inculcate into his subjects as much as possible, but was simply to teach it, the probabilities were that it would become monotonous. On the contrary, if his object was to make men and women and to do it by teaching chemistry, it would not be monotonous at all.

I was glad that the reader of this paper referred to this same idea. I believe most heartily, that we should constantly remember that the object in view in teaching is to make students who shall have the ability to think and to do.

This morning, I think it was, that reference was made to that little book of Prof. James (*Talks to Teachers*), in which he remarked that, "the best educated man is he that can do the most useful things with the least effort." I think we will all agree that the *subject* of physics will go as far to assist students to do useful things as any subject that is found in the curriculum. And I believe the *teaching* of physics will go farther. When I say to do things, I mean to do them not only with the hands, but the brain as well.

Again, if you will allow me to refer to my observations. As I go about the state I find not a few who are striving to teach physics who are not able to do things with their hands, teachers of physics who can not manipulate apparatus.

Some of you were present at the address of Prof. Nichols at the Ithaca meeting, and you remember that one of the things that he did that evening was to produce different types of vibrations of a cord. He remarked that the experiment was a success, but he also remarked afterward that he did not do as well the first time he tried it. The habit of manipulating on the part of the teacher is an important matter.

I believe that the teachers of physics are as well prepared as the teachers of many other subjects, but we have every reason to desire marked improvements.

Prof. Howard Lyon—There is one feature of the paper read today that was specially interesting to me—that in which the speaker called attention to the difficulty in learning physics, due to the abruptness of the subject-matter. It is to me one of the most important considerations to the teacher of physics and deserves a more extended reference than was given to it in the paper.

I wonder why the secondary schools do not adopt what is excellent in the methods of the colleges. These methods are not ideal but certainly in one respect they are right. The college plan does take into consideration the time element in its instruction.

An individual can not take his three meals in the morning but he must have an opportunity to repeat his meals as he can digest and assimilate them. Facts and principles in physics require time for mental digestion and assimilation.

I do not advocate a sweeping reform in our methods, but I do know that lessons in physics and science in general can not be crowded to advantage. We try to teach physics in 20 or 40 weeks, and its new matter comes too abruptly to permit even superficial understanding in most cases. This fact is specially true in the case of girls whose early experience with reference to physical facts and phenomena is limited.

Expért opinion seems to differ as to the nature of the masculine and feminine mind, but I am sure that the difficulties that girls meet in physics arise not from the difference in their nature mainly, but from the poverty of their fund of observational knowledge.

Girls are not permitted to see mechanical devices in their childhood, and mothers seem reluctant to encourage observation and interpretation of physical phenomena. If girls could have a better opportunity to observe in their early life they would be better prepared for their high school work. If their training is not begun in their homes it should be begun in the schoolroom.

Every girl that I have ever taught has been a splendid student of physics if she has been what is termed a "tomboy" and she has always taken up her advanced work with enthusiasm. I am now teaching a girl who runs, jumps and throws a stone as well as a boy and she is an excellent student of physics.

Much is said of nature study. This instruction has, in a large manner, omitted experiments that have to do with physical forces. The phenomena of the air, of lightning, wind and storm are not less attractive than the phenomena of life. Why can we not begin in the grammar school with lessons concerning physical forces, something that would lead a boy or girl to understand mechanical devices? Why not let them have occasional lessons and simple explanations of principles that are now restricted to high school pupils? Why can not the teacher present these lessons very simply, not as formal science but as simple practical instruction? I have seen marked results in later development in the case of students who had had simple lessons in their early training in physical phenomena.

Prof. Charles F. Binns—I am very much interested in this discussion of the study of physics and particularly the turn which the discussion has taken. I think that it is very evident that the girls might take a different attitude toward the subject of physics. I believe that the feminine mind will continue to measure her dress by her fingers. It is something like the Irishman who said, " It is twice the breadth of the length of my hand, and the width is as thick as a brick."

As a means of measuring the capacity of the teacher, it is out of the question to ask, how far it is necessary to go to qualify in a certain subject. The more reserve force a man possesses may be the measure of his success as a teacher, but knowledge is not the only necessity for the aptitude to teach successfully.

It seems to me, that in this subject of physics the general aptitude for mechanics should come well to the front. The most successful teacher is the one that can handle tools.

Prof. H. J. Schmitz—I am somewhat troubled in my teaching of physics to know the amount of theory to use in connection with it. I think the less theory we take the better it is. I should like to know what other teachers do.

Prof. C. B. Thwing—We are teaching half a dozen sciences in one and the student must be helped to remember a great many facts. A theory, even though not proved to be true, may be a great help to the student in classifying the facts and remembering them.

To illustrate, I sometimes tell a little " fairy story " to explain latent heat. Where does the energy go to that is used to melt a body? If we think of the molecules as having different dimensions along different axes it is possible that when a definite temperature is reached the molecules begin to rotate about their longer axes. This would consume energy and increase the freedom of motion of the molecules without raising the temperature. The side bonds would be neutralized, while the end bonds hold the molecules together in the liquid form. When all the molecules have been put in rotation the temperature would again rise, till at the boiling point the molecules begin to rotate about their shorter axes and cohesion is entirely destroyed, and the gaseous state is reached.

The student is helped by such concrete pictures to master the abstract laws of the science.

PREPARATION AND TRAINING OF THE TEACHER OF CHEMISTRY

BY DR LYMAN C. NEWELL, STATE NORMAL SCHOOL, LOWELL (MASS.)

A recent number of a popular educational journal contained the following significant statement, "One becomes weary of listening to the numerous descriptions of what the teacher ought to be, when teachers are and will continue to be just ordinary mortals." At a first glance this assertion seems true, but a more careful consideration leads us to conclude that it is a specious half truth. The programs of educational gatherings during the last five years in this country and in England have had one marked characteristic, viz. an unusually large number of papers and addresses on the art of teaching. This is specially true of those meetings devoted to science. At the meeting of the American Association for the Advancement of Science held at Denver in August 1901, seven papers on the teaching of chemistry were read before the Chemical section, one of them being the annual address of the vice-president and chairman of that section. These papers covered all branches of pedagogic chemistry, and their presentation [illegible] the view that, however weary some may be of hearing what a teacher and teaching should be, all are not disposed to ignore the [illegible] presentation of this means of improvement.

Believing this, I willingly accepted the invitation to present to you some thoughts on the preparation and training of the teacher of chemistry. Progress in teaching comes largely from consideration, comparison and discussion. [illegible] never be eliminated by concealment, nor can good ones be spread by hiding them under a beaker or in a water bath. Methods need constant regeneration. Education, specially in science, is evolutionary. There are few long steps, few sudden leaps in our work. We must keep moving; the fountain must be constantly playing. Cessation is stagnation. I hope the time will never come when we can not talk, write, consult and argue about our work.

Teachers of chemistry need a broader, more uniform and more accurate knowledge of the fundamental facts and principles of chemistry. The foundation is essential to the stability of any superstructure. If our knowledge of the fundamentals is uneven, or out of plumb, then our superstructure will be rickety and in danger of cracking or of falling over at some critical moment. Several reasons lead me to emphasize this factor in considering the preparation and training of the teacher of chemistry.

At the last meeting of the Johns Hopkins University Alumni Association of New England a classmate, who is connected with a large college, said, "The weakest part of our course in chemistry is the general inorganic for beginners." This is true, no doubt, of many other colleges. Several unfavorable conditions attend the instruction of beginners in chemistry in college. The laboratory sections are often too large to permit individual instruction, the text is usually presented to indifferent listeners in the form of entertaining lectures or of an intricate outline, and the course itself is often condensed to ridiculous brevity in order to conform to the unavoidable restrictions of the curriculum. It is true that these conditions are sometimes unavoidable and that the department of chemistry is only partly responsible for them. Nevertheless, the students suffer, and too many graduate from college inadequately prepared to teach elementary chemistry, because their instruction in that portion of the subject has been irregular. It is as true of chemistry as of most subjects, that we know best what we studied last. And many a recent graduate attempts to force his latest work on suffering and helpless beginners. Pres. Remsen once said, that when he left the University of Tübingen he could teach the most advanced organic chemistry better than the elementary inorganic chemistry. In many colleges the student passes directly from general chemistry to qualitative analysis, then to quantitative analysis, and finally to organic chemistry or some other advanced work. Seldom does he have a chance to review his general chemistry from a broad standpoint. There is a tendency in some institutions to remedy these defects, and before many years students while in college will be able to lay those broad foundations which are so essential for effective teaching of elementary chemistry.

A second reason for emphasizing the necessity of a better knowledge of the fundamentals is that in the last five years such an enormous number of facts have been literally hurled at us that those houses which are built on the sand are in danger of being swept away. Physical chemistry, electro-chemistry, chemical inactivity at low temperatures, dissociation at high temperatures, matter inert at all temperatures, radiant energy, molecules of eight atoms, molecules of a single atom, and liquefied gases galore have been suddently thrust on us. I am not a foe to these newer conceptions, nor am I indifferent to the magnificent results obtained by such men as Ramsay, Nernst, J. J. Thomson, Van't Hoff and others. But important as these topics are and will become, they should not be allowed to usurp or obscure our conception of the foundations of chemistry. A teacher in one of our Boston high schools was asked by the writer what use he made of the theory of electrolytic dissociation. He replied, "I did considerable last year, but this year I shall do very little because my pupils did not see so much in it as their teacher did." Doubtless a similar vision of the situation led one of the best known teachers of chemistry in this country to say in the preface of his latest book, "In the opinion of the author the time has not yet come for the abandonment of the study of the elements and their compounds in what some are pleased to call the old-fashioned way. Indeed it seems essential that such study must always form the basis of the higher or spiritual study of chemistry." In a few years, no doubt, many of the simpler aspects of physical chemistry will form a part of our elementary courses in chemistry and must therefore be assimilated by teachers, but since physical chemistry is now only a part of the superstructure, it should not be mistaken for the whole edifice. Only the teacher who has a broad knowledge of fundamentals can appreciate the meaning of new details, for such a one alone can determine the value of component parts of the whole. Comfortable teaching is based on an accurate knowledge of the first principles, it rests on unshaken confidence in the primary truths. The teacher who lays the foundations wide and deep need never fear overthrow. On them he can build with assurance as high and attractive a superstructure as desired. A teacher runs no risk of being left behind in taking a year or more to strengthen the foundations. He can easily catch up with the facts, and as he moves onward these facts will find a logical and permanent location in his mind.

A convenient and efficient way to obtain a knowledge of the underlying facts and principles of chemistry is by a judicious and thoughtful study of one of the large manuals of chemistry, such as Remsen's, Mendelieff's, or Freer's, Newth's, Richter's, or Roscoe and Schorlemmer's. Working familiarity with any of these books is an enviable acquisition. They are reservoirs from which we may draw our supply at any time. Make a business of it. Take a year for the task, if necessary. Read with a notebook at hand, or better still mark the margin of the book itself. Determine to remember where and how the facts and principles are treated. Imbibe the spirit of the author, see the truth from his standpoint. Do not be satisfied till the task becomes a pleasure. Gradually the whole panorama will come into view, facts hitherto unknown will assume their proper relation to the whole subject, experiments which one may have thought were his own discoveries will be accredited to the rightful discoverer (possibly Boyle or Lavoisier), laws will reduce themselves to that beautiful simplicity which is an expression of an harmonious nature, theories instead of being mere guesses will inspire to deeper thought and perhaps to intelligent experiment, and out of the vast mass of facts, laws, hypotheses, and theories a foundation will unconsciously be laid on which can be built with confidence and skill a superstructure in which ideas new and old may be harmoniously, artistically, and truthfully incorporated.

The preparation and training of the teacher of chemistry should not be confined solely to this science. Interest should be stimulated in allied sciences. No single science is an independent unit; all overlap. Chemistry has some connection with all the physical and life sciences. Together with physics and pure mathematics it forms the great triangular foundation of physical science. Hence a general knowledge of other sciences is not only helpful but to a certain degree necessary to the successful teaching of chemistry. Such a knowledge keeps one from becoming warped and prejudiced in his judgment of the methods, value and significance of other subjects in the curriculum. Love and enthusiasm for chemistry should not mean contempt and hatred for physics or biology. In answer to the question, "Do you prefer to teach another science besides chemistry?" 19 out of 20 representative teachers in Massachusetts replied "Yes". Those who taught physics invariably regarded this additional work as helpful. The speaker has found physics and mineralogy exceedingly helpful in interpreting many phases of general inorganic chemistry. A science needs a margin, a sinking fund, a reservoir, just as a picture needs atmosphere or a poem needs inspiration. A knowledge of perspective alone will not make an artist, nor will a knowledge of prosody make a poet. And it is just as true that a knowledge of chemistry alone will not make a good teacher of that science. We need "the more" to apply "the little", something beyond the subject to teach subject-matter. Our point of view, our estimation of values, our humor, our judgment, our mental horizon, our general reading, and our hints for the pupil's reading, all these really depend on something outside of mere chemistry. Photography, astronomy, mineralogy, geology, and physical geography stimulate interest in certain aspects of chemistry. This margin, this finish, this better part is that indefinable something which places the inspiring teacher on the right hand and the dull pedagogue on the left.

Probably most teachers of chemistry have at one time or another studied other sciences. It is advisable to arouse this dormant interest and to acquire a generous sympathy, a working knowledge of these sciences. This may be done by reading the scientific journals, such as *Science, Scientific American, Popular Science Monthly, American Journal of Science, Journal of the Franklin Institute,* and by all means the latest journal, *School Science.* Avoid newspaper science. It is usually downright absurdity or barefaced error. A few hours judicious reading during a month will suffice to keep pace with all that one need know of other sciences. Form the habit of reading these journals and stick to it. A German professor was once asked about the progress of a former student. He shook his head and replied, "*Ach, er liest nicht mehr*" (alas he reads no more). Let us take care that we are not similarly condemned.

A few years ago the New England Association of Chemistry Teachers sent out a list of questions, mainly to New England teachers, covering all phases of teaching. Among the questions was this one, "What is your aim as a teacher of chemistry?" An answer which typifies the aim of the best teachers was, "To teach pupils a love for truth and for the science, and to develop a scientific spirit." A most desirable requisite which teachers themselves need is a scientific spirit, or, perhaps better, a scientific attitude of mind. The distinguishing feature of science teaching is not merely the provision of an opportunity to observe, conclude and record. Its vital object is to create and foster a scientific attitude of mind. The highest attainable result will follow, if a scientific spirit is aroused.

That attitude of mind called scientific is hard to describe. One of the most scientific teachers of chemistry in the United States said, "It is asking a great many questions, but few foolish ones." Some of its attributes are a determination to know all the evidence before pronouncing a judgment, precision in thought and statement, a desire to deal with the thing itself, not trusting to secondary sources, unshaken confidence in the triumph of truth, fearless abiding by tested results, willingness to change our conclusions when new evidence is presented, disbelief in the traditional superstitions and nonsense of our ancestors.

Sometimes contrast makes a subject clearer, and possibly the term scientific may be made clearer by illustrating an unscientific state of mind. To deny the truth of what displeases us is unscientific. We have had an excellent example of this species of unscientific behavior in the naval battle recently fought on dry land and in the newspapers. It is also unscientific not to admit our errors, specially our published errors. It is likewise unscientific to accept elastic theories. Prout's hypothesis, the evolution of the elements from a single element, and theories which violate the laws of thermodynamics belong to this class. It is furthermore unscientific to jump at conclusions which we would like very much to draw, if we only had sufficient evidence. How many new elements are annually announced! How many new discoveries are daily heralded which will set the earth spinning from the east to the west as soon as the pseudo-discoverer has obtained a little more evidence! We need more chemists like Morley and no more physicists like Tesla, we need more astronomers like the late lamented Kepler and no more like—well, I must not be captious. I am sure the point is clear.

Probably no general rule can be prescribed for the attainment of a scientific attitude of mind. Yet it can be cultivated. One of the best ways to acquire and foster it is to do some original work. It matters not how extensive or how slight the work, provided it possess the element of originality. Nature by some inscrutable law has decreed that we can learn only of and through ourselves, no one else can learn for us. The soul itself must come to a consciousness of the truth before knowledge is a possession. Every bit of original work coins knowledge. An original demonstration of the hitherto unknown properties of a

593576

chemical compound is worth more to the experimenter than a vast mass of memorized facts. The construction of a new piece of apparatus or the improvement of a method demands continuous exactness of thought infinitely more helpful in acquiring a scientific attitude of mind than can be gained by the remodeling of a whole scheme of qualitative analysis. One reason, I fear, why some teachers shrink from the performance of a few simple experiments demanding exact weighing or measuring is their inability—or would I not better say unwillingness—to carry out the train of reasoning involved in such work. A few hours a week—part of our wasted time—spent in the performance of some original work will soon give that attitude toward teaching science which a genuine judge has in the trial of cases. It will give a mental grasp which is comprehensive enough to perceive the exact value of evidence. It will bring one face to face with truth.

It is impossible, however, for all teachers of chemistry in secondary schools to do research work. Numerous duties consume all spare time, apparatus and materials are not readily obtainable, and books and chemical literature are not always available. On the other hand, it is possible for such teachers to do some work possessing the element of originality. The simplification of apparatus, the wider application of new methods, the qualitative examination of some mineral, rock, mineral water, or industrial by-product offer ample opportunity for original work. Again, if no such work can be done, the teacher should write. Exactness of statement is a mark of exactness of thought. And exactness of thought may be acquired by critical writing. Put your thoughts into accurate language. Tell us about some interesting natural phenomenon in your locality, an example of chemical erosion, a piece of apparatus which has helped you over a hard place, write a brief biography of some of the newer chemists, tell us about anything which interests you. What interests you will surely interest someone else. A managing editor of *The Sun* (New York) when asked by a correspondent what to write up, replied, "Anything that interests you—nothing else." Stevenson always carried two books in his pocket, "one to read in and one to write in." Publish what you write, read it before some association or to a friend. Help overcome the false notion that a scientist can not write clearly and entertainingly. Help make it impossible or at least untruthful for an editor to announce in a prospectus, "We assure you that these articles on science will be both good writing and good science, a combination that is unfortunately too often lacking."

Till about a decade ago chemistry was taught in high schools almost exclusively by a textbook. The pupil studied the book, recited what he had time to memorize, and occasionally listened to lectures or talks by teachers who often did some experiments. This unscientific method of teaching the science of chemistry began to be abandoned about 10 years ago. Some schools went to the other extreme in allowing the pupils to do all the experiments, while the teacher did the studying and reciting. Fortunately the evil effects of this second unscientific method of teaching the science of chemistry were soon discovered, and it is gradually being replaced by a judicious combination of individual experimental work done by the pupil, study, explanation, and recitation of textbook by the pupil, and largely informal lecture instruction by the teacher. It would be profitable to discuss the bearing of these three elements on the preparation and training of the teacher of chemistry, but the time at my disposal compels the limitation of the discussion to one phase of one element, viz, the supervision of laboratory work.

It seldom happens that a method of teaching changes suddenly, but when the change is abrupt, the application of the new method is attended with more or less misfortune. The laboratory method of teaching chemistry came on us rather suddenly, and in many schools its use has not only been injudicious but unprofitable. We know very little about its psychology and still less about its ethics. Many teachers can not account for their failures, and hence they are not slow to condemn the laboratory method, whereas it is the fault of the teacher, not of the method. Though my views on this question have appeared in print, I can not refrain from repeating some of them, because I believe the failure to grasp certain psychologic principles accounts for much of the aimless work done by pupils and for some of the unrest, discomfort, and inefficiency shown by many teachers in all sections of the country.

Laboratory work is concrete labor. It employs the hands as well as the head. Concrete labor is difficult to shirk. In studying history, geometry, or language the mind easily wanders. But when the mind is following an experiment in the laboratory, it does not readily ramble. Something is constantly happening; the mind being carried quickly from concrete to concrete has little or no time to roam. Apparatus must be arranged, chemicals collected, the experiments started, watched, controlled, or stopped. If, however, the teacher or the principal does not favor laboratory work, if the program restricts the experimental work to a pitiable minimum, if the teacher persists in explaining in the classroom what the pupil can think out unaided in the laboratory from his own data, then it is folly to expect the laboratory work to yield mental results. There must be enough carefully prepared and judiciously supervised laboratory work to prevent the normal tendency to shirk and to teach the pupil the supreme value of mental self-reliance. Again the experimental work must be dignified enough to command the self-respect of a thoughtful pupil but not so difficult or repulsive as to frighten him, for in either case the tendency to shirk will be hard to overcome. Furthermore, the laboratory work must be followed up by searching questions, for if the pupil once gets the idea that he need not think after he has completed his experiment, then you have opened for him a broad avenue for shirking. Each pupil should be taught at the earliest possible moment that he or she may be asked any reasonable question on any experiment. If such a spirit prevails, pupils soon learn to get from this concrete labor that invaluable acquisition, so often needed in later life, viz, the power to complete a piece of work accurately, quietly, quickly.

Again laboratory work is suited to relieve mental fatigue. It is restful work, if rightfully performed, because it affords opportunities for harmonious activity. But, if the laboratory period is too long or too short, if confusion reigns, if there is no opportunity for pupils, specially girls, to sit down in the laboratory while writing notes, consulting reference books, or performing slow experiments, if the directions for performing the experiments are brief, long, or so vague that their interpretation demands an excessive amount of mental energy, then mental fatigue will be increased, not relieved. The laboratory work under such circumstances can not afford that mental rest which it is designed to provide. Mind and body will refuse to act normally.

Third, laboratory work is a grand medium for the production of the highest grade of reactive conduct. Reception is followed by reaction, impression by expression. Motor activities are the expression of thought. But, if the laboratory work is inadequately supervised, owing to large divisions, program irregularities, or pedagogic inefficiency, then the reactive conduct will be of a low, perhaps the lowest, grade. The pupil who is called on to be doing something constantly should be stimulated by an environment which will enable him to do the right thing in the best way. Good expression can not come from bad or meager impression. Teachers of chemistry who let the laboratory run itself, who do not help a confused pupil to regain mental poise, who do not realize that beginners need constant advice and direction, are unprofitable servants of the science of chemistry. The teacher's place is beside the pupil, showing him how to form good habits of observation, teaching him the difference between accuracy and vagueness, preventing him from doing slipshod or slovenly work, stimulating him to cultivate mental self-reliance, not telling him facts which he can observe himself, but suggesting legitimate channels for the application of his total power. I recall with pleasure my work under Pres. Remsen, because he never discouraged me when I needed help and he always left me to myself when he saw that the best avenue of escape was through my own mental efforts.

Again, we must not be satisfied because our pupils are curious. Curiosity is a good sign, but at best it is only a means to an end. It should be encouraged at first, but, once active, it should be rationalized. Pupils must be led from curiosity to interest, from mere indiscriminate desire to know disconnected facts to an intelligent craving for systematic knowledge. The transition from curiosity to interest is a critical time for both teacher and pupil. Too often a thoughtless word, an unintentional oversight, or a palpable lack of interest on the teacher's part may upset the delicate poise of the pupil's mind and turn to permanent indifference or reckless curiosity what might have become lifelong interest. Special care should be taken by the teacher to gather up the disconnected observations made by pupils and place them before the learner in such a light that the threads of curiosity will become the fabric of interest. Once interested, the pupil should be led on into the realm of voluntary attention. It is this factor that we all need to develop, for it is of incalculable value in the acquisition of knowledge; it is essential to complete psychic life.

Pupils seldom see the importance of voluntary attention. They are contented to "do experiments" and stop there. They need to be taught the fundamental value of learning to complete with success an experiment requiring patience, skill and confidence. The necessity of teaching voluntary attention is one reason why I believe so firmly that simple quantitative experiments should form a definite part of an elementary course in chemistry. Such work cultivates voluntary attention. As I have watched my classes for several years perform simple experiments involving accurate weighing or measuring, I have been forced to conclude that this work is the most effective way of teaching voluntary attention. It requires an effort of the will for spirited pupils to sit quietly before a balance till the pans stop swinging, to wait for a solution to run down the inside of a burette before the volume is read, to let a thermometer remain in a liquid long enough to assume the temperature of the liquid. But this very effort of the will is needed day after day when the pupil leaves school. It must be acquired, if one is to be a successful worker in any field.

Whatever or wherever our occupation, whether in Syracuse or Manila, we shall always need the power to think continuously, work skilfully, and judge accurately. We do not need chemists half so much as we need men who will voluntarily attend to their work. The problems which are coming on us as a nation need for their solution men who have been trained to do things accurately, with dispatch, with a regard for all the evidence, with a profound love of truth, for that truth which is so forcefully exhibited by the laws of chemistry, for that outer truth which arouses in one a consciousness of inward truth.

Closely related to curiosity, interest, and attention is the principle of inhibition. It was thought about half a century ago that certain nerves checked the action of certain muscles. This is doubtless true, but it is a narrow interpretation of a more general function of the nervous system. This conception of arrest has been extended to cover our mental life, irrespective of nerve stimulus as such, and is called inhibition. It is not necessary that an inhibiting idea be specially strong to arrest another idea, for here as elsewhere the mental machinery is delicately adjusted. A strong motor idea may be easily and completely inhibited by a simple and apparently foreign idea. Faint impressions on the confines of consciousness may throw a strong idea completely off the track. Some trivial observation may upset a thought which is seeking expression, and either arrest it completely or so modify it that the final judgment is delayed or even completely abandoned. Pupils should not be allowed to yield to unwarranted inhibitions. Provision should be made in all laboratory work for allowing the pupil's mind to travel without needless inhibitions from the object of the experiment through the manipulation to the conclusion. The work should be so supervised that pupils will see the whole field of consciousness and not yield to reckless impulse or foolish inhibition. Many books now in use actually prevent the mind from acting calmly, continuously, and logically. Experiments to be mentally profitable should be so expressed and arranged that the average pupil can not fail to grasp the title, the exact method of procedure, the essential observations to be made, and the probable conclusion which the observations will permit. The title of each experiment should be known so that the pupil may have an initial idea, a mental start, a guiding star. Unless he begins correctly, he may not, probably will not, end correctly. A knowledge of the exact method of procedure is essential, otherwise he will not know how, when or where to begin his work, nor can he carry it on intelligently, confidently, profitably. A great deal of time is wasted in a laboratory because pupils do not know how to work, and in many cases they are not to blame for this aimless, fruitless labor, because they were not at some time told or shown how to work. They yield to some foolish inhibition or reckless impulse, simply because they see no other path. Again, the desired observations should be indicated in some way. Pupils are learning how to observe; one object of experimental work is to teach observation. Surely we ought not to assume what we are trying to teach. Beginners do not know the difference between the trivial and the important, the scientific and the unscientific. They must be pointed toward the path having the fewest inhibitions, even though such direction reveals some truth which they might possibly discover if sufficient time were taken. Finally, each experiment should lead to some definite result. Otherwise the student is left suspended. is actually robbed of the inestimable privilege of drawing a conclusion. Experience shows, however, that this conclusion must be indicated. It need not be deliberately told, but it can be suggested by appropriate questions. Such questions eliminate inhibitions, they conduct the mind along a logical path, they extend a helping hand to a halting thought, they train the mind to pass from cause to effect.

If you ask how the teacher may attain the power to apply these principles, the answer is simple. Study your pupils and yourself, but yourself the more. The problem has only two unknown quantities—yourself and your pupil. Success depends on the teacher's knowledge of his own psychologic and spiritual life as well as on the discovery of mental crises in his pupils. He must create an atmosphere which fosters calm, deliberate, confident, tranquil mental action. He himself must have passed through the gates of curiosity and interest into the temple of voluntary attention before he can lead others to the same spot. He must acquire that spiritual insight which perceives the truth in himself, he must be constantly conscious of that better self, for it is this unseen self which teaches.

Section B. BIOLOGY

PREPARATION OF SECONDARY TEACHERS IN BIOLOGY

BY PROF. FRANCIS E. LLOYD, TEACHERS COLLEGE, NEW YORK

We may well, at the outset, present our conception of the high school as a factor in the preparation of men and women for their life. The most important feature of the high school lies in the fact that it is the final and only school of higher education for the multitude of men and women in the higher walks of life. Only a very small proportion have had or will have in the future more than a high school training. To give the very best opportunities for that education in the most efficient way is a task worthy of the best efforts of highly educated, trained and earnest teachers, which our unexampled opportunities for higher education can supply. This much must be conceded and kept ever in the foreground of the teacher's consciousness that to do the daily round of duties as a leader of a generation of youth just on the threshold of manhood and womanhood is a high privilege not to be measured by dollars and cents, nor even by the approval, often too tardy, of the audience of parents and supervisors, but by the conviction that his work will surely count for the amelioration of the individual morally, mentally and physically. A teacher with such a conviction, and thoroughly equipped for his work is filling a high office in society. It is not too much to expect and demand that persons who look to filling such an office shall be able to satisfy all the demands for efficiency which may in justice be made on them.

What, then, are the demands as actually formulated? On this point there is at this time no general unity, but for our present purpose we may examine the regulations formulated by New York city. These represent the maximum demand, and will serve for the time being as a goal for which the rest of the country would do well to strive.

Scholastic attainments and teaching experience are set off against each other. When the former are present, in the highest amount, they consist in bachelor's degree and two years' postgraduate study, accompanied by some knowledge of the science of education. In the absence of these, eight years' successful experience may be substituted for them. Though these demands represent the extreme in this country, it will be noticed that a candidate may enter the work with no teaching experience and after no special study of the problems which he has to face, and the special methods of the subject involved. Otherwise, the demands are fair, and have been effective in building up a body of efficient teachers.

Let us now turn our attention to the actual conditions which obtain in the large majority of our high schools throughout the country. The teachers may, roughly speaking, be considered, as to their origin, as consisting of two groups; those, namely, who have had no regular opportunities beyond the normal school and whose preparation has been received primarily there; and, secondly, those who are college graduates merely, or hold one or more of the higher degrees. It must not be understood that we are, in considering these facts, launching any criticisms against the many able teachers who, with acknowledged incompleteness of training, are themselves doing all in their power to advance the educational work of the high schools. It is, however, necessary to collate the facts in order to aid in bringing about the much needed development toward a uniformly high standard of work. The greatest step toward this is gained when we demand and get uniformity in the preparation of the teachers themselves. And by uniformity we mean, not a rigid formal kind of uniformity, but a uniformly high grade of teachers, whose work shall always be above a standard of quality we can hardly at present be said to have reached.

The teaching force of our high school, then, is made up, in the first place, of persons who have at best made use of the opportunities afforded by the average normal schools. Of such, some have gone directly into high schools after, perhaps, supplementing their attainments by taking courses in summer schools, at seaside laboratories and the like. These persons have had, it is admitted, certain advantages over the college-trained, to be considered later, in that some attention has been paid to the general and particular educational requirements demanded of the candidate for school positions. We must observe, however, that such training as they get is very insufficient in amount and admittedly adapted, not to the needs of the secondary, but to those of the elementary teacher. And here we contend that preparation for elementary teaching is not preparation for secondary teaching any more than experience in the university prepares for efficient work in secondary instruction. It may be and has often been maintained that it involves merely a question of adaptability on the part of the teacher. Without denying the contention, we still hold without fear of denial that the facts observed indicate pretty strongly that such adaptability is lacking, and the practical result is that we find at the present moment all kinds of courses, from essentially college work to essentially grade work, offered to the high school student. And this is not right.

It very frequently happens also that teachers in the elementary school, allured by the large money return to be obtained in high school positions, amplify their normal school training by taking work in the summer and seek high school places. This indicates an ambition on the part of such teachers which is at once to be commended and deplored, and a condition in our school system only to be deplored. We condemn without qualification the failure to recognize, in an economic way, the worth of the kindergarten and the elementary teacher. Their office is no higher and no lower, their responsibility no greater and no less than that of other teachers; and, utopian or not, we look for a time when the pecuniary reason for a progress, if we may so call it, from the elementary to the high school will be removed.

There is, however, another reason for the change sought by many teachers, a reason which must be recognized as valid and working out for good on the whole. Without qualifying our contention as to the equal value of elementary and higher education, we are forced to admit differences in temperament and mental life which make elementary teaching as much of a drag to some as a delight to others. These are differences which qualify or disqualify, and a man or woman whose intellectual life is not, to a fair measure, satisfied and stimulated by the more heterogeneous elementary course, may well endeavor to find satisfaction in the less heterogeneous character of the high school course. Recruits to the force of secondary teachers of this kind should be welcomed, but only on the satisfaction of rigid demands to be outlined further along. Barring such exceptions as just indicated, we can not admit that the average elementary teacher who has gained admittance to the high school in the way here under discussion, is in any degree fitted for the work. Years in the lower school have fixed ideals and conceptions of teaching which, as expressed in method, are not adequate for the high school, and on the whole tend to lower the standard and nature of secondary education. Add to this the usually wofully deficient and hazy knowledge of the special subjects on which they are required to concentrate, and we have the cause for a lamentable degree of failure in development of the high school. If any proof is needed of the truth of the last statement, one has but to be subjected to the necessity of examining a few normal school graduates on the most important general knowledge of physiology, by which we mean physiology of animals and plants—knowledge which is fundamental for each and every teacher, without which any presentation of botany or zoology must necessarily be completely inadequate and misleading—to be convinced. I do not attempt to throw blame on anyone, teacher or student, in particular. The normal school has avowedly its definite object in preparing teachers for elementary work. It certainly can not, under its present construction, expect to do more. It is maintained that the means to one end may not properly be regarded as the means to another.

Before closing this part of the subject, it would be only fair, if time permitted, to consider at greater length the case of teachers who, after extending their education by studying at summer schools, gain entrance to high school teaching. To make sweeping generalizations is here specially dangerous, and the best one can do is to argue from the few definite cases which come under one's notice, and from the nature of the preparation in general.

In the second place, we see the high school staff recruited from the ranks of those who have received their bachelor's degree. This implies at most some general work in education proper, without any practical work, and at best an insufficient knowledge of the subjects which the candidate is required to teach.

It will be seen that the normal school graduate is thus in a position of advantage in point of professional training, and on this rests the belief, only partially justified, that the deficiency in scholarship is made good. We may here not improperly acknowledge the debt the community owes to the normal school for carrying on a work which has made for a body of teachers of constantly increasing efficiency; we still maintain, however, that the aim of the normal school is at a different—not a lower or a higher—mark than that of the high school, and therefore s inadequate to our present needs in this regard.

That the college graduate is not sufficiently prepared for the work before him as a high school teacher may not be doubted. His attainment is represented, in biology, by, say, two years of zoology—occasionally more, often less; and what shall we say of botany? In a great many cases, the credit of a 14 week course in " analysis " or " picking flowers to pieces " is a flattering maximum. Very frequently, in many of our leading colleges, a sort of appendage to the course in elementary biology, by a zoologist, is made to do duty for the whole subject of botany. It would be laughable if it were not almost pathetic. Is it any wonder that elementary teachers in botany are still floundering around in a mire of antiquated morphology? Is it any wonder that botany, which in most people's minds is still "picking flowers to pieces," is regarded as a study for girls? An examination of a class of girls offering a college entrance option in botany had disabused the speaker's mind of even this. And it was Huxley, that veteran in the fight for progress in education, that urged so often the placing of botany and human physiology in the schools. Does any one suppose that, in his mind, botany was the namby-pamby kind of thing it has grown in this country so frequently to be?

The knowledge of physiology, too, which the college graduate, as such, possesses is very often far from sufficient to give him anything like what is called a grasp of the subject, and may more rightly be characterized as a conglomeration of confused ideas.

Here, again, I must not be interpreted as criticizing directly our colleges or their graduates, though neither may be said to be beyond criticism. Each institution has to be governed according to its own resources and can not, if it would, always satisfy external demands. Too often, however, they will not.

As to the students, they are ill prepared partly because of the failure, for one reason or another, to use all the opportunities at their command, or because of their immaturity. The latter, I believe to be the real difficulty. The college course in the matter of time alone does not mean enough in the effect it has in refining the judgment; and the acquaintance with the subjects has not been long and intimate enough to result in that accumulation of knowledge from direct observation which alone makes a resourceful and inspiring teacher, independent of the textbook and full of his own invention.

As to the particular knowledge of the practical problems in facing a class, in planning and carrying out a laboratory course adapted to high school students, we may say that they know nothing. The result has almost invariably been that teachers who have had no training in these lines have taken their college courses and given them in rarefied, if not clarified, form to their students, and there has been a misfit all along the line.

In those communities in which higher demands have been made, where, accordingly, teachers holding the master's and even the doctor's degree have been obtained, some of these insufficiencies have been less apparent, sometimes more so. For greater special knowledge of the subject, with the total absence of professional training, has not always been an improvement on the other condition. Eminently successful teachers who have never had a special professional training, there are, but in spite and not by virtue of their lack. To say that teachers are born and not made does not exclude the proposition that, granting the qualities of birth, they may be vastly improved by definite training.

Having surveyed the present conditions of education, we may now move forward to our conclusion by outlining the ground which, we believe, the training of the secondary teacher ought to cover.

The requirements may be regarded, for convenience, as those in subject-matter and in education.

[1]The requirements in subject-matter should consist in at least nine points of undergraduate study in biology, of which at least

---

[1] The following is a digest of the speaker's remarks under this head.

three should be either botany or zoology. The work in biology should be buttressed by thorough work in physics and chemistry.

During the senior year in college courses in education should be had, consisting in the history and principles of education, and in the theory and practice of secondary teaching in biology. The latter, with which we are specially concerned here, should consist in lectures treating of the various problems which confront the secondary teacher, of reading and discussion. This should, as far as possible, be made to yield practical results in giving the student exercise in the command of his powers of presentation. When possible, there should, also, be some time given to observation of public school work, carried on in an efficient and organized way.

The postgraduate preparation should consist of further study of biology at a recognized university for at least one year, during which period the student should receive training in methods of independent thought and investigation. This is not a demand that all secondary teachers should be actual research workers, but rather that the spirit and methods of the discoverer should be familiar to them through experience. At least the master's degree should be earned.

In education the work should consist in (1) a course in general secondary teaching, and (2) an advanced course in the theory and practice of secondary teaching in biology. The ground covered in such a course should be mainly practical, and should consist in a detailed study of the materials and methods involved, the construction of the course of study, and of actual teaching in the high school, under criticism.

The student's power to collate and organize the materials and to present the same in a scholarly manner should be evidenced by the preparation of a satisfactory thesis treating of some problem of secondary education. Such a course should lead up to the grant of a master's diploma coordinate with the master's degree, and of equal value with it, but with special significance.

The standard of scholarship set in the above statement is the master's degree, and, for the country at large, it is as high a standard as may at present be urged. It will be sufficient probably for some years to come, except in the largest cities, provided the scholastic attainments are accompanied by the equally important educational preparation.

Inspector Arthur G. Clement—I would like to ask Prof. Lloyd if the training he mentions presupposes a college education?

Prof. Lloyd—The first course is open to seniors, who have attained an average college record both in botany and zoology. We have allowed a student to take botany for the first time with the course. From now on, however, we have two courses, one of which will be open to seniors, and we can thereby allow them to take for the first one, either botany or zoology, whichever can be consistently taken with their course, but only in cases where it is absolutely necessary. In order to enter the more advanced course, they must have had at least two years' training in zoology and two years' training in botany, and at the same time must be pursuing original work in research.

Inspector Clement—A student should have a full course, and after that take up as much special work as he has time for. In addition to the training the teachers receive, they should have genuine love for the subject-matter and patience with the students. Teachers often fail because they have no patience. The student is not able to follow, and the teacher will not go over the work again. Hence I think that a good training should tend to make a teacher patient in helping dull students.

Prof. Henry R. Linville—The thought occurs to me that young people who are preparing for the profession of teaching, when not endowed with the necessary capacity for such work, should be made aware of their deficiency by training school teachers.

Prof. F. E. Lloyd—Of course a full college education is required, and preliminary knowledge of physics and chemistry is demanded. As to the points mentioned, love of subject-matter and patience with children, all those points have been taken up. As for me, I would not for a moment hesitate to criticize a candidate if I thought the motive was other than devotion to the profession, which should be the basal motive. As to the use of scientific literature, that is one of the things insisted on.

Prof. F. M. McMurry—I know a teacher who for years in the past has been obliged to work out his own experience. It has been somewhat to his advantage. By his experience he has been able to learn more and to study his pupils more. They are specially trying to train teachers, so that it will not be necessary for them to practise on the pupils that are placed in their charge.

WHAT THE TEACHER OF BOTANY IN SECONDARY SCHOOLS SHOULD BE PREPARED TO DO

BY DR A. J. GROUT, BROOKLYN BOYS HIGH SCHOOL

[*Abstract*]

I came here with several things in mind which I wished to say. A great many of them have been said much better than I could say them. Consequently I shall be obliged to slight some things that I intended to emphasize.

Of course a great many people who begin to teach, teach things because they must be taught. I have come more and more to a conclusion which is very trite and accepted by everybody, in my opinion, but is not lived up to, that is, that the aim of teaching is to make better, nobler, and more capable men and women, and not simply encyclopedias of learning.

I am outlining what I would like to do. We have our ideals, but can live up to them only as circumstances permit. We are not able to live up to them because of personal limitations also. I am able to a great extent to live up to my belief with respect to drawing. When a youth begins the drawing of scientific objects, help to bring out the finest points. If you keep at him, he will see every curve in the line, and he certainly is trained in the habit of observation. Fidelity to truth is not so common as one could wish, nor sufficiently appreciated. In science we should have exact truth. If our boys must tell the truth in matters of science, the effects are seen in moral character, and in time will spread to the other departments of life. Botanical knowledge offers general popular instruction. It should give to every one a new interest in life, an interest that can be taken up when other things fail. You see the lady in the city playing bridge whist, and the farmer's wife in the country lowering her moral nature, and injuring herself with gossip. A study of botany may correct these things and give new inspiration to those who otherwise have little hope in life.

I think a teacher who is training boys and girls and can not find and give the name of a flower is at fault. Finding the names of plants was formerly the basis of botanical work; and in cases where the study is properly taken up and properly adjusted, I know nothing more helpful in many ways. In my personal experience I have found it invaluable. I want pupils to ask themselves questions; if they find anything interesting in nature, to know what it is. What would our friends be to us if they were nameless? So in plant life. A person reads the description of a common and interesting plant; he can not connect it with the plant he knows unless he has a knowledge of names. I have never failed to awaken enthusiasm when I gave my pupils a proper knowledge of this part of the work. I give them the key if possible, and I want them to be able to find the names of a few flowers in the key. Prof. Ganong has said that this kind of work should be done as outside work by pupils who have special enthusiasm. I think there is a much more general need of this kind of botanical work than this. I would insist that all high school teachers should have the ability to name common objects.

The chief thing in the training of a teacher to do good work, is a love of the subject-matter and a love for the pupil. Enthusiasm is necessary to do anything well. What receipt do you give for enthusiasm? If you want to get it go where it is. It is communicated by contact. You want to go to those institutions where teachers are enthusiastic; and right here I want to add a protest against that great and influential university which discourages enthusiasm. If you want enthusiasm in botany, I can tell you places where it is, Columbia, Cornell, Michigan University, or the less well known University of Vermont. Then, the way to work up a sporadic case of enthusiasm is to do something original along the line of research. If you live within access of the forest, there are problems under your feet which have never been solved, and of which you can give the solution. We know very little about the life of our everyday plants. I did not know for a long time that one of our most common, the jack-in-the-pulpit, on attaining its full vigor, changes the sex and from male becomes female. Your discoveries are not only interesting to you, but you would find that there is no other field in which original observation can be carried on with so little previous training. Your laboratory is all out of doors. Now, if you want to work with enthusiasm and can not get where it is, take up the study for yourself with the best literature available. Tell the pupils of things you have done and read of.

Now you may have enthusiasm and work hard, and have enthusiastic pupils, and they may work hard, and yet they may not be able to pass examinations. I see examinations from a different point of view from many. At present our examinations test memory only. If our education is to do its proper work we must have examinations that test power rather than memory. It seems difficult to get up an examination that will test power. I can not say precisely how it should be done. Our business men claim that our teaching does not give power. As long as examinations test the memory only, and ability of pupils to pass in memory questions, so long shall we hear this complaint.

That our enthusiasm may not be dampened, I ask that examinations may be made up more with reference to this thought; then teachers will be enthusiastic, and persevere in enthusiasm.

If pupils have the power and desire to know more the teacher has done his work well, whatever the results of the examinations. The high school teacher should, doubtless, use the microscope, but it has the disadvantage that in most cases work with it can not be carried on outside of the schoolroom and must stop with the school course.

I believe in training the pupil so far as possible so that he will be able to follow the injunction of the poet to "go forth, under the open sky, and list to nature's teachings."

Prof. F. E. Lloyd—I am impressed by one point mentioned by Dr Grout, and that is, that high school teachers should be, to some degree at least, able to pursue original research in botany or zoology. It is coming to be one of the demands which may justly be made on high school teachers.

Section C. EARTH SCIENCE

GEOGRAPHY FOR TRAINING STUDENTS IN NORMAL SCHOOLS

BY PROF. A. W. FARNHAM, OSWEGO NORMAL SCHOOL

Before discussing the subject, geography for training students in normal schools, we must in a general way determine the place and purpose of the normal school. Its place is between the university and the masses. It is maintained by the people and for the people; and its purpose is to train teachers for more efficient service in the grandest of popular institutions, the public schools. Indeed, the graduates of normal schools holding certificates of scholarship from no higher institutions of learning than the normal schools, will, with few exceptions, find positions in the grades below the high school. The geographic teaching, then, of normal graduates, will cover the field included in elementary school geography.

Let us review the present status of geography requirements and opportunities in New York state normal schools. Their program of studies requires that students in training shall pursue geography the last half of the junior year and the first fourth of the senior year; in all, 30 weeks of daily instruction in 45 minute periods. The illustrative apparatus and material consist of ordinary globes, a not too bountiful supply of maps, one or more sets of raised maps, a modest collection of colored charts made from photographs, a few good lantern slides, and a comfortable working library. All this is good so far as it goes: it is excellent; but it does not go far enough. It does not meet the present demands of geography. How, then, would its efficiency be greatly enhanced? And in what should the "geography for training students in normal schools" consist? These two questions, from the writer's point of view, may be answered as one.

The more recent development and growth of the geographic idea, for want of a better term, has been called "the new geography." Dr Redway in his latest, if not his best published work, has supplied the better term: "the new *basis* of geography." He tells us, what we believe, "that a different interpretation of the nature and scope of geography is growing into the educational systems of the United States. Broadly stated, this interpretation is the mutual relation of geographic environment to political history on the one hand and to economic development on the other." This interpretation is demanded of geography today. A better means of its interpretation would increase the efficiency of geography teaching in our normal schools, and would also more fully equip our graduates for their work in grade schools.

One of the first needs, after an efficient teacher, is that of a laboratory furnished with models and apparatus for practical exercises in physical geography. The work to be done in physical geography can not well be done in the classroom. The models and apparatus to be used can not have proper care and manipulation in the classroom. The geography teacher realizes that a laboratory is a necessity. To illustrate: a study of local weather is in part a study of measurements of atmospheric temperatures, of atmospheric pressures, of humidity of the atmosphere, of direction and velocity of wind currents, all of which must be determined by apparatus working under certain conditions—conditions that can not be found in the classroom. A study of rocks—their composition, relative hardness, and comparative resistance to atmospheric agencies—is necessary for the study of the soil, and is legitimate laboratory work. Mathematical geography is necessary work for the laboratory. The greater part of field work, which is now a necessity in geography teaching, is profitably supplemented by laboratory exercises. The use of government maps, now regarded as indispensable in the study of geography, is unsatisfactory in the classroom. That laboratory work and field work coordinated impress on the minds of pupils the reality of the various earth forms and their influence on life, is not the least argument for the establishment of the laboratory to further the teaching of normal school geography.

The second need is that of an additional program hour to be spent in laboratory exercises and field study. This additional hour is given to chemistry and to physics. Without it, chemistry and physics would largely be deprived of their practical value. With an additional hour, geography would be as greatly benefited as chemistry is or any other experimental science.

The third need is either that of a reduction of the number of studies in normal schools, or an extension of time in which to pursue them. At present, individual student programs are made for from five to seven different subjects. It has to be explained that a student studying only four subjects has head trouble or heart trouble or some other serious defect. Life in the normal school is so "strenuous" that the one idea is to get out of the subjects, not to know them. Under such conditions teachers of geography, as well as those of other subjects, can not require of students as much time as the subject demands.

Here, then, is the most serious charge to be preferred against geography teaching in normal schools, namely, the lack of thoroughness caused by the student's attempt to do more work than can possibly be done in a given time. The result is superficialness and, what is worse, the belief entertained by the student that he knows a subject that still lies outside his mental horizon. Nor does his belief change to honest doubt till he attempts to teach geography. Then his energy is expended in getting subject-matter and holding in memory unassimilated material. His teaching, if it may be called teaching, begins and ends with the book. His pupils never learn from him that the hills and meadows, the streams and the valleys through which they flow, have related earth history, and that each earth form in their immediate neighborhood has had some influence on the settlement of the neighborhood, and also on the industries of its people; for every people will engage in those industries which will bring them the largest returns for their investment, and their geographic environment will largely determine for them what those industries shall be. For instance, the degree of slope is an important factor in determining whether farming or dairying will bring them the greatest commercial success; and also whether lines of transportation may be built with reasonable outlay to connect them with commercial centers, and later, perhaps, to make their locality a commercial center. The presence of water power and access to raw material may decide certain local manufactures. The pupils of a teacher whose geography is between the covers of a book do not learn that the study of the natural features of the landscape about them is a study of geography. How can they? The stream can not rise above its source.

Geography for training students is inadequate for the training students' mission, and will be till individual student programs are made so as to allow time for becoming more fully acquainted with subject-matter, through a wider acquaintance with geographic literature, thus giving the student such a broad grasp of principles that he will be able to teach geography and not the book.

It must be said that special method, or more properly, applied method, is disproportional to the knowledge of underlying subject-matter. Methods of teaching geography must be based on a knowledge of geography. The effort is often made to teach subject-matter and the method of teaching it at the same time, or "some of each" in the same lesson hour—a thing quite unpedagogic. It is not possible that one can give equal attention to a subject of study from the standpoint of the learner and also of the teacher at the same time.

The failure in teaching, when failure occurs, is oftener due to lack of knowledge of subject-matter than of subject method. And here let me say, the writer does not in the least degree disparage the value of methods of presentation, but he does believe that a somewhat thorough knowledge of a given subject must necessarily precede the method of presenting it.

Teachers will very generally teach as they have been taught. If students in training could have sufficient time, outside of the recitation period, for field work, laboratory work and library work, their methods of learning would serve them as methods of teaching. That method is the right method that leads a pupil to observe, compare, relate; that begets a spirit of inquiry and investigation; that enlarges his horizon, makes learning perennial, and increases his own usefulness; that leads him to see that the realm of knowledge is one realm, that one subject of study can not be isolated from all others, and that no subject of study can ever be finished.

Is this an ideal method? Call it so. May it be obtained? Why may it not be obtained? Under less adverse conditions this ideal should be realized through normal school teaching—not of the theory of teaching, but the actual teaching of the subject by the regular teacher in charge.

With this ideal for the teacher's aim, school geography will not in so many cases be a Sahara; the streams of thought will not shrink, shrivel, and dry up in waste-filled channels, but will flow on with increasing volume, and unite in one grand trunk which will make fertile the region through which it flows.

GEOGRAPHY FOR TRAINING STUDENTS IN NORMAL SCHOOLS

BY PROF. C. STUART GAGER, NEW YORK STATE NORMAL COLLEGE, ALBANY

It is the purpose of this paper to defend the following theses:

1 The teacher of geography should first of all be a teacher, second, a teacher of geography.

2 The preparation of the geography teacher should, therefore, progress along two lines: (1) principles of method, general and special; (2) principles of geography.

3 A firsthand acquaintance with the facts of local geography is essential to the clearest understanding of the geography of the distance.

4 The textbook study of the facts of geography to the exclusion of observational work, with the interpretation of the facts, characterizes the teaching of geography in the larger number of schools of the state.

5 The greatest need, therefore, in the education of geography teachers in normal schools is emphasis on the value of observational work, its place and purpose, how it should be conducted, and its correlation with textbook work.

To begin with, then, the teacher of geography should first of all be a teacher; second, a teacher of geography. The lack of professional standing for teachers needs no emphasis. The fact was well set forth by Rice in 1899. We have physicists plenty and geologists plenty; but of teachers whose purpose in life is primarily to be teachers, not scientists, and whose energies are centered in education for its own sake, and not wholly in the tools of education, whose interest is in the pupil and not wholly in the subject-matter, we have not a plenty![1] Only recently in a conversation, the principal of one of the high schools of the state said to me that, after all, he had about come to the conclusion that the "personal equation" is the chief factor in teaching. It was only another version of the "My method's the best for me" doctrine, the cut and dry plan which would not be tolerated for a moment in medicine, but which, somehow, seems to appeal to those who have never known anything better in pedagogy.

---

[1] Butler. 1901. p. 104.

To be sure, the teacher must know his subject-matter. So must the carpenter understand his plane. The study of the subject-matter is as much a part of the preparation of teachers as is the study of education and method. Scholarship, in spirit and in fact, is absolutely essential, but the ability to teach is not implied by its possession. Special knowledge on the foundation of broad scholarship is as necessary in teaching as in law, medicine or theology. The idea that they are fitted to teach which is given young graduate students by the universities, just because they have pursued graduate courses in subject-matter, is a serious drawback in attempting to meet a demand for professional (pedagogic) preparation for teachers. The old maxim "learn by doing," so far as teaching is concerned, has been well brought into question by Payne (1898). If the experience of the past is to be of any value, the plan must be that of the old Greeks, "Learn, then do." Perfection of the art, as in any other profession, will be acquired later, and, if the teacher has a body of fundamental principles as a criterion for judging of his daily work, his future will offer to him opportunity, not only for experience, but opportunity to profit by experience. "Experience makes mistakes, and therefore is not the only guide, but must itself be guided."[1]

The primary duty of every institution which professes to do the work of normal schools or colleges, then, is to educate teachers, not to train them. To create a professional spirit by making clear the fact that teaching is not a performance that one can be taught to go through with as animals are taught to perform tricks, but a serious art based on fundamental principles, "the noblest of professions, but the sorriest of trades." It is one of the fundamental defects of normal schools, as Mace (1901) has recently pointed out, that they are attempting to do two things at once; to give the pupil both matter and method at the same time, giving only a review, instead of the new view of the subject which the teacher should have.[2]

---

[1] Mace. 1897. p. XIII,

Let us now consider the teacher of geography. Here the greatest requisite, first and last and all the time, is a knowledge of subject-matter, combined with a knowledge of the principles of method. And this knowledge must be so broad and deep, and so abreast of the results of contemporary research, as to burst asunder the covers of any school textbook on the subject. The teacher who is unable to see, not only the day's lesson, but the work of the term, yes, of the whole course in its proper perspective, its relation to the subject as a whole, and to other subjects, and above all, to the life of the pupil, is poorly prepared for the serious vocation he has chosen. He must know the portion of the subject that he proposes to teach, not only from the standpoint of the pupil, but also from the standpoint of the teacher. This he can not do the first time that he pursues the subject. He must think it out anew with the class before him in imagination. He must know that with which the subject may begin, the way in which the subject-matter is to be presented, and the source of aid in such presentation, as field work, the topographic map, geographic monographs, reports, and periodicals. Both for his own sake and for that of his pupils, his resources must not be bounded by the limits of an introductory textbook.

The preparation of the geography teacher, therefore, should proceed along two lines. First, principles of method, general and special; second, principles of geography. He should be able to distinguish the study of method, which is the study of fundamental principles, from the study of "methods," which is a consideration of ways and means, devices, apparatus. He should realize that there are three factors in the teaching act, not two only. I have no sympathy with the doctrine expressed before this association two years ago, that "the training of science teachers . . . reduces itself to the formation in them of habits of serious experimentation, accompanied by reading and thinking about the subject to which they are devoting themselves." This is all very desirable, but the training of the teacher of geography or of any other science does not "reduce itself" to this. The teacher needs, in addition, to understand the fundamentals of method, such as the principles of interest, apperception, and self-activity. He ought to know the steps of an induction and their bearing on his work in the classroom. As a teacher he should think, not so much about the subject, as about the mental processes involved in thinking about the subject. His devotion should be to teaching first, to science second.

---

[2] Cf. Harris. 1890.

Second, the prospective teacher of geography should know that this science is no longer a description of the earth, but à serious study of one set of facts and their relation to another.[1] First, the facts concerning earth, air, and water, and second the activities of living beings. He should be impressed with the fact that the present state of the lithosphere, hydrosphere, and atmosphere is the result of a series of causes operative, some of them in the past, and some of them at the present; that these conditions are not permanent, and that in their turn they are the causes of other effects. Unless he has found out some portions of the subject-matter as the result of his own observations and inductions, he should consider his preparation lacking in its most vital point. He will find his whole manner affected in presenting to a class any part of the subject if he knows some part of it at firsthand. His work will be characterized with a vividness and conciseness, with a lively interest and a confidence that can be acquired in no other way.

It is not necessary for the teacher of geography to be a *Forscher*, as the Germans understand the term. If he has found out a fact or a relationship new to him, the desired purpose will have been accomplished as truly as though the fact were new to science. Portions of the work outlined by Davis (1898, 1900), Cornish (1897), Snyder (1899), and the speaker (1900), are truly research work as far as the pupil is concerned, and such exercises should be a part of the education of the teacher of geography.

This leads directly to the third thesis, that a firsthand acquaintance with the facts of local geography is essential to the clearest understanding of the geography of the distance. This has been emphasized well in the writings of Geikie (1892), Davis (1898, 1900, 1901), and others[1] and needs only to be mentioned here. It is a corollary from the principle of apperception.

---

[1] Redway. 1901; Dryer. 1897. ch. 2.

My fourth thesis is, alas, too easy to defend. The textbook study of the facts of geography, to the exclusion of observational work, with the interpretation of observed facts, characterizes the teaching of geography in the larger number of the schools of the state. I have taken a record of the preparation of my pupils for the past four years. These pupils are required to have had the equivalent of a high school course in physical geography before entering the normal college. I find from their records that over 95%, roughly estimated, have never been on a field excursion or had any other work whatsoever outside of learning what the textbook said. In other words, 95% of our high school pupils are studying *about* geography, while only 5% at the most are studying geography. The causal notion seems scarcely to have been hinted at in preparatory school courses. Similar conditions are described by Burrows (1900) who found that in 58 out of 121 schools the work was confined wholly to a study of textbook and map. No wonder that, when he inquired of these same schools if they considered geography of educational value, some of them replied, "Geography as taught at present has little value"; and "Of no educational value except as helping in history lessons"; or, more discouraging still, "You could not educate at all, in the sense of developing thinking powers, by geography."

I do not wish to be understood as considering that textbooks have no place in the teaching of the subject; but textbooks present generalizations which are mere words to the pupil unless he can bring to their interpretation some knowledge of the facts on which they are based. The problem, therefore, is how the teacher may equip the pupil with the necessary data by which he may most clearly apperceive the generalizations of the textbook. Time will permit only the merest outline of the work which the normal should endeavor to give the prospective teacher of geography.

---

[1] Kelton. 1897; Dryer. 1897; Dodge. 1899; Merrill. 1900; Tarr. 1898.

First, a study of types in the field. It was only 100 years ago that Playfair demonstrated the causal relation between streams and valleys, and thereby solved for the world a hitherto unexplained riddle. There is, perhaps, not a school in the state where this demonstration may not be repeated, where a type study may not be made of hills, streams, and valleys, their present condition, their development, and their effect on human activities and industries. The origin and mode of formation of soil, the phenomena of glaciation, and the activities of village and city life, with their interpretation, may be studied at first-hand in almost any school, and this work should form a part of the preparation of teachers of geography in normal schools.

Careful attention should be given to the use of the material gained by observation; first emphasizing the fact that generalizations or concepts are reached only through special notions or percepts, and, therefore, second, how the knowledge of the home geography conditions the clearest apperception of the geography of the distance. Illustrative material, such as maps, models, and pictures, should be discussed, and the pupil stimulated to form the habit of voluntary reading and observation. Ability to represent by diagram or other suitable drawings the geographic form studied should be required.

Some of the most valuable work, judged wholly by results, that I have been able to give consists in taking pupil teachers who have studied about geography in textbooks into the field, where for the first time they are brought face to face with some geographic fact. The observed fact is then converted into a problem, and the proper solution sought. Three excursions I have found to yield unusually large results, and, though they may not be wholly new, I will suggest them here, since they may be repeated anywhere in New York state. The first consists in the study of the origin and mode of formation of soil, as illustrated in an abandoned quarry. The second is for the purpose of studying the formation and development of valleys of erosion as illustrated in hillside gullies and then in the larger permanent stream. In the third excursion attention is given wholly to a consideration of the evidences of glaciation in the home locality. These excursions have disclosed the fact that the pupils who have had a high school course in physical geography have little real knowledge and very vague images and ideas concerning the subject-matter involved. For them the out-of-doors globe does not exist. These excursions show also by their results what a world of new meaning the textbook and map come to have when viewed in the apperceptive setting which the field work makes possible. It seems almost trite to emphasize these truths any longer in our discussions, and yet the fact that pupils continue to come to the normal institutions in a majority of numbers without having had this work shows plainly enough that the subject has not been over-emphasized as an essential factor in the education of teachers. So late as 1889, in a book entitled *Normal Methods of Teaching*,[1] the subject of "methods of teaching" physical geography was thus disposed of: "Little need be said concerning methods of teaching the subject. The pupil will study it from a textbook and recite it." This would indeed seem humorous if it were not in reality so serious.

Prospective teachers ought to be more or less familiar with existing texts on geography, and know the criteria of a good textbook.[2] And last, but by no means least, there should be included the presentation and discussion of the most recent contributions to the science of geography and the pedagogy of the subject, to the end that the prospective teacher may be made to realize that the science of his teaching and the science that he teaches are not crystallized classified portions of knowledge, but living organizations whose most prominent characteristic is development and growth.

To state the matter concisely, normal institutions should be places, not where subject-matter is taught for the first time to prospective teachers, but places where one may learn how to make real to others that which one already knows. The ability to do this demands, first, that the teacher shall know as much as possible of his subject-matter at firsthand; second, that he shall know so much more than he expects to teach that neither the day's lesson nor the year's work will bring him close to the bounds of his own knowledge. He should find little in any elementary textbook on which he can not throw a flood of light from his own investigation and wider reading. And third, and most important of all for the teacher, he should understand the mental processes involved in learning his subject, so that, while the pupil is thinking the subject, the teacher can think the pupil's thinking of the subject. This will result in securing to the pupil the maximum of discipline at the same time that he is enlarging his knowledge and broadening his culture.

---

[1] Brooks. 1889. p. 484.

[2] Blodgett. 1889.

Bibliography of publications referred to in the text

Blodgett, J. H. School Textbooks of Geography. Jour. Sch. Geog. 1899. 3:138.

Brooks, Edward. Normal Methods of Teaching. Phila. 1889.

Burrows, F. R. The Teaching of Geography in Preparatory Schools. Jour. Sch. Geog. 1900. 4:331.

Butler, N. M. Confessions of a Psychologist (editorial comment on G. Stanley Hall's article of above caption), Rev. ed. 1901. 22:103.

Cornish, R. H. Laboratory Work in Elementary Physiography. Jour. Sch. Geog. 1897. 1:172.

Davis, W. M. Home Geography. Jour. Sch. Geog. 1897. 1:2.

——— Practical Exercises in Geography. Nat. Geog. Mag. 1900. 11:62.

——— Local Illustrations of Distant Lands. Jour. Sch. Geog. 1901. 5:85.

Dodge, R. E. Geography Study for Teachers (Emerson). Jour. Sch. Geog. 1899. 3:100.

Dryer, C. R. Studies in Indiana Geography. Terre Haute. 1897.

Gager, C. S. Laboratory Exercises in Physical Geography. Univ. State N. Y. High school bul. 7. Ap. 1900. p. 696.

Geikie, A. The Teaching of Geography. London. 1892.

Harris, W. T. The Future of the Normal School. Rev. ed. 1899. 17:1.

Kelton, M. E. Apperception in Geography. Nat. Geog. Mag. 1900. 11:192.

Mace, W. H. Method in History. Boston. 1897.

——— The Central Defect of the Normal School. Rev. ed. 1901. 21:132.

Merrill, J. A. Field Work in Geographic Teaching. N. Y. Teachers Mag. 1900. 3:9.

Payne, W. H. The Training of the Teacher. Rev. ed. 1899. 16:469.

Redway, J. W. The New Basis of Geography. New York. 1901.

Rice, J. M. Why Teachers have no Professional Standing. Forum. 1899. 27:452.

Snyder, W. H. Geographical Laboratory Work in Worcester Academy. Jour. Sch. Geog. 1899. 3:368.

Tarr, R. S. Physical Geography and Geology in New York Schools. The Science Teacher. 1898. 1:61.

[The third paper was given without notes by Prof. C. T. McFarlane, principal of the state normal school at Brockport. Prof. McFarlane emphasized the necessity of devoting special attention to the relations of life, specially human life and occupations, to the environment, and expressed his belief that a knowledge of the physical controls of life could be taught as well by analyzing the life conditions of selected regions as by beginning with physical geography and ending with the life conditions dependent thereon.

The last paper was by Prof. Will S. Monroe, of the state normal school at Westfield Mass., who outlined the possibilities and necessity of teaching anthropo-geography in normal schools.

An animated discussion followed the papers, to which Frank Carney, of the Ithaca high school, Prof. Albert P. Brigham, of Colgate University, Professors Gager, McFarlane, Monroe and the chairman contributed.]

Section D. NATURE STUDY

WHAT IS THE MINIMUM NATURE STUDY TRAINING FOR A TEACHER IN AN ELEMENTARY SCHOOL?

BY SUP'T DARWIN L. BARDWELL, BINGHAMTON

The discussion of the minimum or of any of the requirements for teachers of nature study, practically supposes that one's mind is made up respecting the field of nature study. It is not my intention, and evidently not the intention of the originators of the program, to call for a discussion of that side of it. You will see that what I have to say will come out of an understanding of what is the proper province of nature study. I have in mind two lines of needs. In the first line of needs, one thing; in the second line of needs, more than one.

For the first. In some correspondence which it has been my privilege to have with teachers, directors and supervisors of nature study in different parts of the country, I received Christmas morning a letter from a supervisor of nature study work in one of the smaller cities of Ohio. He is new in that field, and we have had some correspondence regarding the work he is trying to do in that city. In this letter he said he found that the greatest weakness was the need on the part of his teachers of some experience in nature study itself. That is the first need I wish to emphasize—a need of practical, actual experience. So far as this vital experience is concerned, it is not much matter in what field it is obtained, but it must be in some field if the teacher is to be a successful director of nature study. A teacher who has never traveled outside his town can not teach geography in any but the very poorest manner. He must have had a wide range of experience, personal experience so far as it can be obtained, and his personal experience supplemented and augmented by what he learns from the experience of other travelers in wider fields. The same may be said of the teacher of nature study.

The second line is a basis of material information—facts—something that shall be a stock in trade, materials with which to work. Here I shall speak along three lines.

First, the teacher of nature study must have a fairly intimate acquaintance with the more evident phenomena of the weather and climate in the particular section of the earth in which he lives. It is a common saying that anyone can talk about the weather. Not everyone can talk intelligently about the weather. A fair understanding of some of the more evident facts controlling the weather is highly imperative. Something of an understanding respecting winds, atmospheric pressure, the laws which control the phenomena of erosion and deposit, is an essential portion of a teacher's stock in trade, if he is successfully to carry on this section of work, which it seems to me is properly classed with nature study. To this end, he needs to be pretty fairly familiar with the subject-matter contained in certain sections of any good textbook in physical geography and with the more manifest laws of physics, including pneumatics, hydrostatics, and heat. He needs to know beyond the possibility of question, why it is and how it is that a large body of water helps to keep the general atmospheric conditions more stable and the temperature more uniform throughout the 12 months of the year, than is the case in a section where there is no large body of water. He knows these things because he has investigated them to a certain extent, because he has carried on, in a limited yet true and effectual way, some little experiments pertaining to that sort of thing.

Another need is a vital, intimate acquaintance with certain forms of plant life surrounding him—in short, the old-fashioned botany. I have nothing to say in objection to the microscope in the study of botany. But laboratory work in botany is not a *sine qua non* for the teacher of nature study. It may be a good thing, an excellent thing. It helps to widen the horizon, and may be used with considerable success, or it may be left out entirely and the teacher not be very badly handicapped so far as nature study is concerned. But it is highly imperative that the teacher shall have a clear understanding of a plant like the hepatica, its life history and the laws controlling its life; shall understand something pertaining to the method of inflorescence; in short, he wants to be on good speaking acquaintanceship with the hepatica type of plants. Then he wants to have his range large and his study intimate, so that he can pick up a new flower, belonging to the same family for instance, and by an examination of 10 or 15 seconds will be able to say beyond question that it belongs to the same family. He wants to understand the life and some of the properties and the value to men of some of the vegetables as they are found in this portion of the world. He needs to know how to look at the ordinary tree found in this region, and to see what it has to tell him as it stands by itself. It will tell him in an instant of certain laws. He should be able to tell clearly and at once certain of the great industrial values of certain classes of hard woods. These will be stock in trade, and from these he can amplify and enlarge.

He also wants to have a good, clear familiarity with the fauna surrounding him. He needs to have an acquaintance with a book like Hooker's *Natural History*. Get the study with the microscope, if possible, as that is excellent. It will greatly assist the nature study teacher in the grades; but I would much rather that one of my teachers should know the life history of the toad than to know the structure of the particular ganglion in the toad's anatomy which must be tickled to make the toad jump. Live animals he wants to become familiar with, and not dead ones.

In addition to that, he requires a more intimate acquaintance with certain families and certain types. A more extended study in a certain department, insects, for example, might be had. The same might be said respecting other classes, birds, for instance. It is not necessary, to my mind, that he should know birds and insects intimately, but, in addition to the general knowledge, he should know something quite intimately respecting a few individuals of one of these classes. If it is insects, he should know pretty clearly the general laws of the best classification, so that, if he takes up an insect he has never seen, he will be able to tell the division to which it belongs. There is thus born within him a certain consciousness and power, reserved and actual, which comes from that kind of intimate acquaintance and which goes farther than we can estimate, which helps to arouse enthusiasm, and which makes the child walk safely and with a sure advance into other realms of which less may be known.

So he wants to know something of the life history of certain of the other forms of insect life, as they surround him: what is back of the particular event which occurs when the June bug, or May beetle, comes up to the window and asks to be let in after the lamps are lighted at night.

Have I made clear the field which the teacher of nature study wants to be made familiar with? If he is familiar with these things before he enters upon his work, well and good. If not, they should be made familiar. I have placed them as a minimum.

I am aware that many teachers and most excellent teachers come with less requirement than this, but I take it that it is not our business to encourage the employment of people before they are fairly well equipped to earn a salary. It is not our business to encourage the employment of people till after they know enough, and have acquired enough power to go ahead and work with a considerable degree of sureness and effectiveness. The inexperienced teacher has much to learn; the best have much to learn. But there must be a certain minimum or there is a vast deal of friction, loss of time and energy, and nervousness in worrying about results.

There shall be a basis of actual experience with something. There shall be an acquaintance with facts pertaining to the more evident phenomena of the world around us, including physical geography and physics; in botany, including a familiarity with the general characteristics of the more common types of plants, like the rose, buttercup etc.; and a similar study of the more common forms of animal life as they occur about us.

Mrs Mary Rogers Miller—The design of this program was not made entirely clear by the statement of the subjects in the printed form. Since the training of teachers is that part of the nature study movement in which I have had the greatest interest, I desired to put all of our attention on that particular point this afternoon. I wanted a basis from which we could work; so I asked Prof. Bardwell to give us his idea of the minimum training in nature study that should be required of a teacher before entering on her duties in any school. I had not in mind a teacher who was expected to devote her time to nature study; but the fact that we don't seem to be quite on the same platform does not make me unhappy. I told several people that I hoped we should not all agree, and that each might go away with a bee in his bonnet and something to think about for a year at least.

What I want to have you think about specially, if you will, is the teacher who is going to teach in your school, if you are a superintendent, and of whom you wish to require some nature teaching. What are you going to expect of her? Prof. Bardwell, I think, may have in mind a teacher who is going to teach nature study only.

Sup't Bardwell—I have not, no ma'am.

Mrs Miller—I am set right. We will go on with the next. My notion was that, after Prof. Bardwell told us what we ought to expect of the teacher, we should consider this question: Where is this person who expects to become a teacher in the future going to get nature study training? Where and how? I have selected for this part of the discussion several people in whom I have confidence. The first is Miss Elizabeth Carss of the Teachers College, New York. Miss Carss will tell some of the trials and tribulations, as well as of the successes of a nature study supervisor.

WHERE AND HOW CAN NATURE STUDY TRAINING BE OBTAINED ?

BY MISS ELIZABETH CARSS, TEACHERS COLLEGE, NEW YORK

The necessity for training in nature study can be seen by an examination of a large number of outlines of courses of study for elementary schools. In nearly all public and in a large number of private schools some kind of nature study is required.

The interpretation of outlines of nature study is often difficult, as only a few broad headings are given, and there is no relation between the subjects selected and the other work of the grade. This indefiniteness is frequently due to the lack of understanding of the educational value of nature study in the school curriculum. The teacher is usually left to interpret the course for herself, and, unless she has the right training to help her in this, the result will often be unsatisfactory. When I say right training, I do not wish to imply necessarily a long specialized study, but rather some intimate knowledge of natural objects, as was suggested in the preceding paper on minimum requirements. The great difference between the demand made on the elementary teacher of nature study and the high school teacher of science is that, though nature study should have a scientific basis, it must touch on many subjects, and should serve to start within the children a lifelong interest in the world about them, while high school teaching calls for a clearly defined course in some subject, hence a thorough knowledge of the subject-matter.

If we grant that teachers should be fitted to bring nature into the schoolroom, the question naturally arises: Where can such training be obtained?

There are several reasons why colleges and universities can not be called the best places for training for nature study teaching. In the first place, the training of the professors and instructors is not that which would lead them to understand the needs of children of the grammar school age. In the second place, the work given in the universities is not accessible to those who are training to be elementary teachers. The great value of college courses in science is that they give scientific method of thought and work; and for those who, after years of teaching, wish to take up special supervision of nature study, such courses are almost indispensable.

Summer schools have aided many teachers who could afford to attend them. Nearly all state agricultural colleges have opened summer schools, in some cases free of charge. Among the larger universities that have definitely announced summer courses in nature study are Cornell, Columbia and the University of Chicago. The value of these courses is that they enrich the fund of subject-matter and give new method of work. The drawback to the value of the work is that the materials studied in the fields during July and August are not those that can be seen or studied in the school year. The summer courses do not usually suggest winter work, and the environment of the school in which the teacher is situated is often very different from that of the summer school.

Extension work done by agricultural colleges, specially by the bureau of nature study at Cornell, has been of inestimable service in directly stimulating the children through correspondence and in extending information and suggestions to the teachers by means of leaflets.

We must look to the normal schools for the large supply of elementary teachers, and should therefore expect to find training in nature study in these institutions. How is the demand met in general by the normal schools? After examining 60 catalogues, none of which was earlier than 1899, I find that without exception some course in elementary science is offered. Physiology is almost invariably required, and the aim, as often stated, is to fit teachers to give the necessary instruction required in the public schools. The courses given at the normal schools differ widely in character and may be classed under two heads: (1) those giving elementary science and laying no stress on application to teaching; (2) those making such application the main consideration. Under the first heading, the usual courses are, one half year each of botany and zoology, often the same amount of chemistry and physics, and frequently mineralogy or geology in addition. These courses are often elective, but sometimes nearly all those mentioned are required. It must be said that these courses, in some cases at least, fail to furnish the student with either suitable subject-matter or good method of work. In botany and zoology students are often given close analysis of parts or the study of minute structures before they have any acquaintance with the function of parts or with the environment and habit of the plant or animal studied. Under the second heading, where training in teaching is considered of greater importance, I have found the following plans suggested: (1) subject-matter taught in the grades to be studied by the normal students with daily observation of the school work, also the preparation of lesson plans, and lectures in the history of science; (2) the subjects taught in science grouped under the heading, " nature studies ", including botany, zoology, physiology, chemistry, physics and geography; (3) elementary courses in science which aim to be guides for nature study teaching, with apparatus planned with a view to its value and simplicity for schoolroom demonstration; (4) courses in method of teaching elementary science as supplementary to regular science work.

From the observation of work in a number of normal schools and a knowledge of the preparation of many normal school graduates, the following general criticisms of normal school training in science are in a number of cases justifiable. (1) The work has often been so unscientifically presented that students have not an accurate knowledge of even the elementary facts. (2) Too many subjects are taken up in a short space of time, and this leads to scattering, hence students do not acquire the power of handling a new subject. (3) Nature study has not been considered as equally educational in value with other subjects, therefore, sufficient attention to its underlying principles has not been given. (4) The suggestions given in method courses for this work are often too formal in character and, when applied to the schoolroom, produce dislike for the subject among the children.

Teachers come to the elementary school in a large number of cases with absolutely no desire to teach nature study and with very little knowledge of how to go about it. Yet many school boards require it, and principals insist that it be carried on. Here the function of a supervisor of nature study is most important, for, if she understand her work, she may give teachers the very best kind of training for nature study teaching.

What are, then, the requisites for a helpful supervisor? Of first importance is a thorough knowledge of children and school work. (2) A good training in several sciences, more specially biology, physics and geography. (3) Abundance of original observation of the habits and haunts of animals and plants—the natural history point of view. (4) Thorough understanding of the educational aims and purposes of the subject. (5) Insight to understand how to help untrained workers and to utilize the knowledge of teachers of experience and some scientific training. (6) Wide knowledge of books suitable to aid teachers and for children's reading. (7) Knowledge of how and where to secure material.

Provided the supervisor be thus well equipped, what is the work before her? In the first place, to outline a course of study that shall be suited to the children and to the locality, sufficiently flexible to permit of a certain individuality in the work of each room, sufficiently detailed for clearness, correlated with other subjects where correlation gives strength to all subjects concerned, and arranged, as far as possible, to avoid overlapping of topics from year to year. In many outlines I have found a direction such as the following: "During the autumn, study trees, buds, twigs, flight of birds, etc., for all grades". In one school I found three different grades studying the germination of the bean. The lowest grade of the three was interested, the others acted as if they were utterly weary of the bean and its germination. Children should not be kept back in nature study any more than in any other subject.

After the plan is made on paper, there comes the difficulty of carrying it out. To do this, the supervisor must first get the cooperation of her teachers. Meetings with all the teachers in a school may be held, and the plan of work thoroughly explained to them, and reasons given for the selection of topics. Suggestions from the teachers should also be sought. If possible, give talks on the educational principles, subject-matter and schoolroom devices of study. Meeting with the teachers of the separate grades is valuable; for here the outline for the grade can be specially discussed, difficulties answered, correlation of work planned for. The supervisor should occasionally give a lesson to the children and encourage them by taking interest in their work and the specimens in the room, and, if possible, occasionally conduct a field excursion to some neighboring locality. After the observation of a lesson by the class teacher, the supervisor can often give helpful suggestions, though tact and judgment are here necessary. The criticism should touch on important points or it becomes valueless. Material that is almost impossible to be obtained should not be required. In any case, the supervisor should be able to tell where either pupil or teacher may get it, and in some instances should provide it. The task of supervision of nature study is a difficult one, requiring energy, resources and sound training in science. No one, however, has a greater opportunity to improve the work in nature study than the supervisor who comes in direct contact with teachers and pupils.

After one or more courses in elementary science, students in some of the normal school courses at the present time are assigned for observation and practical work in the school under the direction of the supervisor of nature study. If this work in the practice school is to be of any great value to the students, it should be carefully planned. The following arrangement has been found to produce some very encouraging results. The aims of nature study and the principles on which the work is based are fully discussed with the students, and a brief review of what has been accomplished by others in this subject, is given. As far as possible, both the merits and defects of various schemes are discussed. The outlines of nature study for the school in which they are to observe are explained. Before the observation, they are given instructions in arranging lesson plans, and are required to prepare plans which will show how they would teach the lessons they are to see, suggesting materials, illustrations, etc. The lessons are then observed, and a careful written report of them required. The students are brought together for a discussion of the preliminary plans and the report of the observation. In this way the student compares her work with that of the teacher, and points of weakness or strength in preparation and presentation of subject-matter, method of questioning, use of illustrations, etc., are brought forward.

After such observation, students are given a chance to become more intimately acquainted with the work, by assisting with it. They may be assigned to direct a group of children on a field trip or in garden work, if there be a garden. Students may also be assigned to special rooms, where they are to become acquainted with the children, and suggest ways of collecting and caring for living specimens of plants or animals in the schoolroom. Finally, the student may teach a series of nature lessons in the room where most of her practical work has been done, and where the children are best known to her.

It is true that such a plan calls for a great amount of thought and labor, but, if carefully carried out, it will give the student an invaluable knowledge of the difficulties and possibilities of conducting such work, and will give her a means of measuring the result of her work with that of others. Errors can be directly pointed out, and valuable or original ideas tested.

Mrs Mary Rogers Miller—Among the various places where teachers are trained, we have training schools and training classes. If nature study is a good thing, and most of us think it is, or we should not be here today, we want to call to account some of these training schools and classes and ask them what they are doing to prepare their students to do the work we want done. Miss King is going to tell us what they do in nature study in a training school.[1]

Mrs Miller—Before we take up the third division of this afternoon's work, I want to ask Prof. Sheldon to speak of the normal school nature study.

Prof. C. S. Sheldon—I came here to get information and to get suggestions in regard to my work for the ensuing term. All I know at present with regard to nature study work as it has been done there, is that there is a class in nature method 20 weeks each term. It is repeated two terms in the year. Students are obliged to take the nature method just as they are obliged to take 20 weeks in geography methods. Twenty weeks are devoted to the preparation for the work of nature study. The conditions are more favorable than in some of the largest cities in several ways. We can go out during recitation period or with teachers in method class and observe for ourselves at any time when the weather is good, and return in time for the following recitation. Three quarters of an hour will give us a good basis for future discussions and plans. Teachers in the practice schools are not all of them, of course, teaching nature study at any given hour during the day. We generally select those to teach this work who have been best prepared and show the greatest interest.

---

[1] Miss King did not submit a manuscript for printing.

It occurred to me that there is one thing that sometimes I fear we, even as teachers of nature, forget, and that is that the main object in teaching to be sought for is not the imparting of subject-matter, but the creating of ideas in children, and to this end it has always seemed to me that the first requisite is a very live interest in the teacher herself. I say herself, for we have 10 ladies to one gentleman in our own normal school, and the proportion is increasingly larger in many of the normal schools today.

I am not prepared to make any talk on this at all. I was merely taking notes on the ideas presented, thinking I might be able to make some more definite changes. In the future, I may have more experience to guide me.

Mrs Miller—Then I understand that in the normal school and training school, students have a foundation of scientific knowledge before they begin nature study? That you plan to adapt what they have gained of science knowledge to the nature study teaching? I would like to know how it works out.

Prof. Sheldon—I wish to say that there is one difficulty in preparation. Many of the students in coming to us have evidently had their training in science elsewhere, and we are expected to accept a certain amount of such knowledge from other schools. Frequently we find that such knowledge is lacking, though they have passed the requirements in the Regents examinations. Such knowledge is lacking, and they are sent back into the work in biology to prepare themselves more thoroughly.

Mrs Miller—Is there no such thing as teaching nature without technical science? And is not a mistake made in teaching science without nature? I know people filled with science who seem to know very little of nature.

Prof. N. A. Harvey—Folks come poorly prepared in the subject-matter. I know it is not any credit to a teacher in any grade to complain of the work in the grade below. But many amusing things have come within my observation recently. One girl was going over to teach a class one day last month. I was walking with her, and talking about her work. She suddenly thought about something. She said, "Does the moon rise?" "Why," I said, "yes, the moon rises." I think questions about the moon were involved in the subject she expected to teach. She said, "Does it set?" I said, "Yes, the same as the sun. Didn't you know it set?" "No, I didn't know the moon set." "Well, you have seen the moon in the sky?" "Yes, I have seen the moon." "How did you suppose it got up there?" "I never thought about it." That is a striking illustration, though it is no reflection on the intelligence of the girl. She was a bright girl.

In a class for the study of insects not long ago, one girl, one of our brightest students, said, "I can't find the sting of this bumblebee. I have looked on the head and I have looked on the wings and I have looked on the abdomen." "When you were teaching your class about bees, what did you teach about the sting?" "I taught that that was the sting" (pointing to the tongue).

A class were studying the katydid. They had all read stories and poems about the katydid. When it was first presented to each member of the class, I asked what the specimen was. At last some one said it was a katydid, and a murmur of surprise went over the room. One said, "I thought a katydid was a bird!" I asked how many thought so. Eleven in a class of about 50 thought that the katydid was a bird. That was true in three different classes where I inquired in that same day.

These things tell nothing about the kind of work that has been done in the high schools. They do tell about the condition of the pupils and the knowledge of the girls that come to us to teach.

I went into a class in the 7th grade one day. The teacher was teaching about a moth. She had a good plan and was presenting it in a good way. The pupils were not paying attention to the work. The reason for the lack of interest was that that same moth had been the subject for a lesson in a number of the lower grades, and they had lost interest in it.

Mrs Miller—We all agree that it is not the amount of information, but the training one gets from the finding out that is of value. Yet I wonder how many teachers can resist the temptation to "tell it" when they know it? It is one of the hard things to learn.

[Here followed an informal discussion of the subject, in which the previous speakers, and Prof. Spencer of Cornell and Sup't Young of New Rochelle took part.]

Mrs Milller—Mr Beach of Buffalo has a plan to present for teachers' nature study classes.

SUGGESTIONS FOR A TEACHERS CLASS IN NATURE STUDY

BY CHANNING E. BEACH, BUFFALO SCHOOL 23

The following brief outline of work for a teachers nature study class has been prepared with special reference to the teachers of city schools, and it will consider the class as a means of meeting those difficulties which confront a city school teacher when he attempts work in nature study.

Briefly, these difficulties can be arranged under two heads: (1) lack of knowledge, (2) difficulty in obtaining material for class work.

In introducing a relatively new subject like nature study into the school curriculum, we are confronted by the fact that many excellent teachers now employed have had no adequate preparation for giving proper instruction in that subject. Where nature study lessons are optional with the teachers, many still hesitate to begin because of their lack of knowledge. Others, having begun the work, feel the need of more assistance than can be derived from books. But a relatively small number of teachers can spare the time and money to attend the summer schools and obtain instruction there; and it is to meet the needs of these city teachers without interfering with their regular work that teachers classes in nature study have been planned.

The factors to be considered in organizing such a class are three: a well qualified leader, interested teachers, and the subject-matter.

The success of the class will depend primarily and chiefly on the leader; and it may be well to enumerate some of the qualifications for that position. He should possess a fund of accurate information regarding natural objects, specially their habits, life history, and environment; and a general knowledge of their scientific classification and nomenclature will be of service but not essential. The wider his range of knowledge the better, because nature study is not limited to any one of the natural sciences.

He should be thoroughly acquainted with the locality, that he may choose the best places for the field trips. He ought to possess the traits that make a good teacher. But, above all, he should possess a love for nature, that subtle instinct and finer feeling which swell the heart with thoughts beyond expression and draw one irresistibly into the open fields and whispering woods. This he can not impart, but fortunately it is contagious. Among the teachers in every city there is undoubtedly some one interested and informed in scientific matters who would be willing to aid his fellow teachers. The members of this association might give some of their time in this cause, as it will assist in the advancement of science, which is one of the aims of our association. If there happens to be a local scientific society, some of its members might act as leaders, or the society might be induced to take full charge of the work. If it be impossible to secure a leader who meets all requirements, it will be necessary to apply a synthetic method and get the best of several different personalities.

Let us consider, now, the class, its formation, composition and size. It may be begun on either side—the class may organize and choose a leader or a leader may appoint himself and advertise for a class. It would be better however if some organized society, or even the local school authorities, took the matter in hand.

The size of the class is important. If too large, time is lost, and the whole class does not get the full advantages of the work. If too small, the leader will be obliged to supply all the energy which keeps things moving. From experience in such a class, I think 20 are too many. Ten are a good number, enough to keep up the interest, and not too many for a good leader to keep together. In case the class should wish to visit a locality not accessible by trolley, the railroads will make a reduced rate for an organized party of 10.

Before discussing the plans for class work, it is necessary to decide what the *aim* is. As I understand it, our aim is a practical one, and it is to enable teachers of city schools to obtain material for use in their classroom, and to give them the knowledge and directions which will enable them to employ this material to the best advantage. If this practical side of the question is well carried out, the more ethical aim will be acquired unconsciously.

To obtain the necessary material, field trips are necessary. The field trip must be carefully planned. The leader should be acquainted with the territory visited; and it is usually advisable for him to explore the spot a day or two in advance to make sure that specimens worth collecting will be found. He should decide in advance what will best suit the needs of his class, having ascertained that it may be obtained, and be prepared to give its most interesting habits and characteristics.

The apparatus necessary will depend on the material to be collected; but some receptacle for plants and insects, a pail for aquatic life, and a net for insects and for dredging are essential.

The problem of transportation usually can be met by using the trolley cars. On arriving at the chosen ground, the plan of work should be carefully explained, if it has not been done before, directions for collecting should be given, and attention be directed to the points of general interest, such as soil, environment, and general relations.

Then, having prepared his class, the leader will lead them to the places where the chosen material is, and see that each one obtains enough for practical purposes. The class should, at the same time, study the habits and characteristics of the plant or animal collected, and also note the environment, that they may reproduce that condition in the schoolroom as far as possible. A little care at this time will save much trouble and may prevent disappointment later.

It is impossible for anyone to explain all that may be seen in even an hour's trip through the woods and meadows, and that is the reason for emphasizing one particular point. At the same time, the leader can and should call attention to some of the delightful and interesting features which present themselves.

A bird's nest containing eggs or young, a squirrel or chipmunk chattering in the trees, a stately old tree or some humble insect, may afford an opportunity for the leader to give his class a bit of real nature study in the field. It is pleasant to sit down on a convenient bank and enjoy the beauty of the hills and meadows, the color of the foliage with its beautiful greens in the spring and its splendid hues in autumn, the sky and clouds and to listen to some of our wild birds singing their sweet notes of freedom. All this is pleasant and profitable; but it should not prevent the accomplishment of the work planned, because a teacher can not arouse much permanent interest in his class of 40 or 50 children by telling them what he has seen, no matter how deep his feelings may have been; but, let him place before his class something they can see and study for themselves, then will those pupils share his pleasune.

When the work in the field has been finished, the class should be assembled, the day's work carefully reviewed, and directions for the preservation of material should be given. Saturday is the most convenient time for a class of teachers to make a field excursion, but the necessity of keeping the collected material 36 hours before using it is a great disadvantage. In collecting, this fact should be kept in mind, specially if flowers are to be gathered. If it be possible, it would be better to have the trip in the afternoon after school, but there are practical objections to that plan also, chiefly the question of time.

At this general summary of the events of the trip, the leader will have an opportunity to answer the questions which the class have to ask, and he is a wise man who can answer even a fourth of those questions.

This briefly is a plan for a field lesson. It should follow the same fundamental principles which underlie instruction in any subject.

Owing to the infinite variety of conditions which will be met on field excursions, I have not entered into the details of such a trip; but have tried to sketch broadly a plan which would apply to any field work, whether the object were to collect pollywogs or hepaticas. Yet it may be profitable to mention a few of the things worth collecting for use in the schoolroom and suggest some general lines of study for the class of teachers. The distribution of plant and animal life, noticing what things prefer certain conditions, as a swamp, hill, woods, etc., the effect of environment, which is very noticeable in plants; the struggle for existence; the action of the physical forces of nature; the relations of different forms of life, as exemplified by the familiar relation between bees and pollination—all these and many others are fruitful subjects for study and observation, and are also practical.

In the autumn months the dispersion of seed and the preparation for winter are the most striking phenomena, and material illustrating them can easily be procured. Goldenrod, asters, the autumnal leaves, the berries of the bittersweet, or a branch of the thorn apple bush, as the children call it, etc., will beautify a schoolroom wonderfully. The dead and dry weeds, such as the teazel and the yarrow, are excellent for drawing lessons. This is the time of year to collect cocoons, specially the cecropia, to be kept till the spring. When the leaves have fallen, it is easy to find the nests of the birds, which have been so carefully hidden, and can now be taken and kept for use when the time comes.

In the spring the first excursion should be made as soon as the weather permits; and the roots or bulbs of some of our early wild flowers can be taken, and, if potted with a little care, the plants will blossom in the schoolroom. Hepaticas, squirrel corn, violets and trilliums take kindly to this treatment. It is an excellent thing to have a wild flower garden if the school yard permits.

Crawfish, insect larvae, newts, toads eggs, and small fish can be obtained for the aquariums.

But, in collecting, see to it that our rare and beautiful forms of plant or animal life are not exterminated; but choose, rather, those forms which are so abundant that the number taken will not affect the species unfavorably.

The Cornell leaflets for teachers are invaluable in this work and can be obtained with little trouble.

In concluding, let me review briefly what has been said. The class is for the benefit of the teachers, and its first aim is to meet their needs in a practical way. To obtain the best results, the class should be of a convenient size. The work of each excursion should be planned in advance, care being taken not to attempt too much. The plan should be pedagogic and, barring accidents, should be followed. The leader should see that each member of the class gets the full benefit of the work. The burden of responsibility will fall chiefly on the shoulders of the leader, and he must be chosen with care. If you can find a guide whose experiences afield are wide and varied, whose knowledge is accurate, whose eyes and ears are well trained, whose tact and kindness are unfailing, one "who in the love of Nature holds communion with her visible forms", and to whom "she speaks a various language"—if you find such a guide, then are you blessed indeed.

Saturday morning, December 28

SECTION MEETINGS

Section A. PHYSICS AND CHEMISTRY

COLLEGE ENTRANCE PREPARATION OF STUDENTS AS VIEWED FROM THE SECONDARY SCHOOL MAN'S STANDPOINT

BY PROF. R. J. KITTREDGE, SCHENECTADY UNION CLASSICAL INSTITUTE

In dealing with this subject we may perhaps properly consider it under three heads: first, college requirements in physics for entrance and efforts of the preparatory schools to meet these requirements; second, physics as related to other subjects in the college and high school curriculum; third, certain comparisons between the scientific and classical methods of instruction, and suggestions for betterment.

First then, what are our colleges requiring for entrance, and what are the preparatory schools doing to meet these requirements? To answer these questions, I have examined the entrance requirements of some 20 of our leading colleges and the courses of instruction of a number of our preparatory schools. Some of the colleges have in physics no entrance requirements at all, as they have no scientific course, or at least nothing more than a very limited instruction in science. Some others demand one year of a combination of textbook work and laboratory work, as indicated in some one or several of the textbooks designated. Some require no laboratory work at all, but those that require it require a notebook with at least 35 or 40 experiments performed by the candidate. Where a list of special exercises is called for, the majority of the colleges ask either for the Regents list or for that of the National Educational Association, taken directly from the book of Hall & Bergen. In the former list we have 66 experiments, or rather groups of experiments, for many of them contain a number of subdivisions, each one of which may be considered a separate experiment. Many of these experiments are elementary; but they give a fair list of the fundamental laws of physics, while they do not make sure that the applicant has actually performed any laboratory work. In the second list we have 61 experiments from which to select. These are in general somewhat more difficult than those of the Regents list, in that they require more costly or more intricate apparatus, though about half of them cover the same ground as those of the Regents. They omit some subjects usually placed in such lists, notably the pendulum and some of the simple machines as well as the more simple laws of strings in acoustics. Some things are demanded under the subject of electricity and magnetism that are difficult to perform and unsatisfactory, when performed. The demands can be classed as higher than the Regents' work, requiring, as they do, more maturity of mind for the handling. These two lists can however be so used by proper selection as to give a year's work that will satisfy both requirements. This is that which I have attempted in my own class work and with fair results.

Now what are the secondary schools doing? I find that they nearly all offer physics in their science courses and are thus in advance of the college requirements. They provide from one half year's to two years' work in physics and that in the latter part of the curriculum. The great majority of the secondary schools have one full year, combining textbook with laboratory work. So much for the subject of physics as we find it in the high school and as a requisite for entrance to college.

We reach the second part of this paper: How is physics related to other subjects in the curriculum of the college and the preparatory school? Let us take a comprehensive view of the case and see just what is being done along the general line of science. Scarcely two colleges, we find, have the same entrance requirements. Some require a science for entrance to all courses; some require three sciences for the scientific course; some two; some one; and some offer such a course but require no science at all for entrance. Indeed even a technical school, we find, that requires neither Latin, Greek, nor science of any kind for entrance. And the condition in the preparatory schools can hardly be said to be better than that in the colleges. In order to make comparison the more easily in this matter, I have tabulated the subjects taught and the time in years devoted to each subject in a considerable group of our high schools and academies, as follows:

Physics	1	½	1	1	1	1	2	1	1	1	1
Chemistry	½	½	1	1	1	1	2	1	½	0	1
Physiology	⅓	½	1	½	1?	½	0	⅓	½	0	⅓
Physiography	1	0	½	½	1	½	0	⅔	½	⅓	⅓
Botany	½	½	½	½	1	½	0	⅓	0	0	⅓
Zoology	½	½	0	½	1	½	0	0	½	0	⅓
Geology	0	½	½	½	1	½	0	⅓	0	0	⅓
Astronomy	0	0	0	0	1	½	0	0	0	0	⅓

Though this is a limited list of the high schools and academies of the country, yet I believe that it gives a fair illustration of the general method that obtains in the secondary schools. We see that they are trying, at least, to do a pretty large amount of work in the sciences and are teaching in eight separate subjects, giving from one third of a year to a full year to each subject. There is one notable exception to this general rule, and that is in the school which gives two years each to physics and chemistry and makes no attempt at any other science subject.[1]

For comparison's sake, I have made a table also of the language subjects as taught in these same schools.[2] I have omitted English, as I take it for granted that most educators are agreed that English should be taught for four years in all the curriculums. We do not therefore need to enter it in the comparison. You will notice the unanimity in the requirement of four years of Latin and three of Greek with the option of two or three years each of French or German. I have failed to find any school, in the somewhat limited list of catalogues at command, that attempts another language. (It is possible that in some the Spanish may recently have been introduced.)

We all know that there are students who, so to speak, take naturally to the languages, as a duck to water. We know also that the reverse is true, that there are students who dislike the ics and are fond of the sciences. Of course, we have cer- students who are good in all subjects and others who are in all. The great majority, however, appear to have a al and natural appetency for some one or perhaps two he great departments of knowledge: language, science, iematics, history.

---

[1] Since writing the above, I find that the high school in Chelsea Mass. offers four years of physics.

[2] This table was not received up to the date of printing.

at the greater number of students take Latin is well known l educators. Now the question arises: Is this because the ents themselves prefer it or because they are otherwise enced to take it? Latin holds, and has long held supremacy e field. It is one of the most thoroughly taught subjects ir schools. It may be regarded as one of the more difficult ies. Is it the prestige of the Latin, or the impression of its riority as an educative study, or the acknowledged ability which it is taught, or the pressure brought to bear by nt or teacher on the student, or the inherent difficulty of study itself—one or all these—that goes to influence the ent in his choice? Much as a belt runs to the higher part of lley, so the student seems to tend to the harder and more ough lines of education. This is of course natural to the r, the strenuously constituted class of students. But the remains, account for it as we may, that most students take atin.

vas speaking with a classical man not long ago about this er. He said: "You science men don't know what you ." Perhaps we don't. Then we should find out. We ld determine what is best for our department and clearly unitedly make our demand for that best thing. How our ical friends would smile if we should lay out a course for with one year for Latin, one for Greek, one for French, or German, and a half year each for Spanish, Italian, Rus- Dutch, and then fill in what remains with science! Yet does that essentially differ from their arrangement of our science course? They allow a year for physics, chemistry, ography, biology, etc., arrange for electives in as many more, ill in with from one to three languages.

ly should not the scientific student ask and receive just as ugh and complete an education as the classical student? because of any essential difference in the nature of the subject? I much doubt it; indeed, I am impressed with the conviction that, if a person pursues a course in science similar to the present language course, he will come forth from that course in ability in his chosen field the equal of his classical brother in his chosen field. We promptly admit that some need special classical training. Not a word would I speak against that training. I am only speaking my word for a precisely corresponding scientific training. But there is this other distinctive class that demands the sciences and not the languages. Are not we who have these minds in charge for the next generation, wronging them if we fail to equip them thus in their chosen field? English should of course be taught the four years, as has been intimated, and the present intermediate and elective courses arranged for as now.

If we agree on this point, namely, that a course similar to the present classical course—science subject in place of language subject—should be provided for our science students, what science shall replace the Latin? I feel confident that no one will question the right of physics to this high place. If Latin is the mother of languages, physics may be regarded as the father of sciences. The tendency is already in this direction. In most schools physics has scarcely less than one year; in some it has two years; and in all schools and colleges it ranks as one of the most generally taught and best equipped of the sciences. Physics applies mathematics, makes the eyes observant, trains every faculty, and forms the natural introduction to all the other sciences. If it is thus rightly taught for the four years, it should help the student to a fine perception, a correct judgment, good sense in practical affairs, and genuine culture, all of which goes to constitute the educated man or woman.

We frequently hear a girl express the idea that physics is a proper study for boys but of little use for girls. This is not correct, however, for physics is of equal value to the girl and the boy. Yet a young lady of this sort who was in one of my classes, in answer to a question on the dew-point, said that, when ice water was placed in a pitcher, the little drops of water that formed on the outside were the dew-points. She also, in answering a question how much of an iceberg will be above the water, replied that, as the specific gravity is less than one, it will all be above. Perhaps such a student is hardly likely to make a success in science, though she may do well in some other course of study. On the other hand, commend me to the young ladies for the best kept notebooks, and the neatest manipulation of apparatus. If the laws of momentum, for example, are shown to apply to the shaking of a rug, the laws of heat to the washing of dishes and to the canning of fruit, together with a thousand other practical applications, no cry of dislike is likely to arise from the female part of the class.

We are handicapped in the proper teaching of physics in a variety of ways. It is hard to find the teacher who is really well educated in this department. This difficulty, however, is becoming less, in fact all difficulties are lessening as the real value of science comes to be more and more recognized. It costs money too to equip a laboratory, yet I find that our boards of education, when they become acquainted and interested, are as ready to appropriate money for scientific purposes as for any other. It requires but a few years to equip a good working laboratory under judicious expenditure of a fair appropriation. The greatest difficulty I find in textbooks. There are plenty of them, such as they are, but some are too hard, some too easy, some are given to too much laboratory work, etc. The textbook of physics should be as the grammar of a language, as a book of reference, a book of laws and explanations. We do not ask a student in classics to work out a declension in Latin from a copy of Caesar's *Commentaries*, but from the grammar; yet some expect the student of physics to work out Boyle's law from experiments before he knows what Boyle's law is. We seem to compliment the young fellow highly by placing him thus about on a level with Boyle or Mariotte, but we do him injustice just the same. Should he not learn all he can about the law that he is expected to prove, the discoveries concerning the law since Boyle first stated it, and be familiar with the apparatus and the discrepancies he is certain to find, before he attempts to work it out for himself? That is, should he not know grammar and vocabulary before he attempts translation?

At present, little if any credit is given in college for the physics work of our secondary schools. Can we wonder at this when only a year is given to the preparation, and in that year we hurry through the subjects of mechanics, heat, light, sound, electricity and magnetism? Could not the first year be spent with profit in learning the fundamental laws, acquiring ability to measure and perform simple experiments? Could not the second year be spent in the study of mechanics, performing more experiments of greater difficulty? Could not the third year be devoted to longer, more precise experimentation, with special attention to the subjects of heat, light and sound, leaving the fourth year for more advanced work in electricity and magnetism and the manufacture of apparatus? We would thus have a foundation for any of the other science subjects, and leave the colleges free to prepare the student specially for his life work.

In drawing this paper to a close, let us review the points touched on. We find no two colleges have the same entrance requirements in physics, and no two preparatory schools are teaching it in exactly the same manner. We find science wofully neglected in both college and preparatory school, the correlation poor between them, and a lack of maturity in the results obtained. We find the classics have reached a state of uniformity that indicates a stable condition; and I make the following suggestions: That we unite in seeking proper recognition for our subjects, that we have a scientific course in science similar to the classical course in language, that physics be given the same place in such a course as Latin holds in the other, that not more than four sciences be taught in the preparatory schools, and that the colleges arrange courses to correlate with these.

Prof. H. J. Schmitz—I would like to make a few remarks. First, I would like to protest against the idea of the scientific and classical education for the high school. What is education, and how can a scientific course differ from any other if it means the development of the boy or girl for life? If the ideal thing is to fit the young people for life, it can be done in one as well as in the other. It is a mistake to talk of scientific and classical education for young pupils.

I believe that every school should have an ideal of its own. What this shall be, depends on circumstances. There may be schools in which students want a commercial education. Others which wish to prepare for college. But what are we going to do with the schools in general? The tendency is to fit pupils for higher power instead of for life. What should they demand? If a pupil has a general education, it is all that is necessary. The high school should provide this, and not aim merely to prepare for college. A course for the general benefit of mankind is what we want.

Prof. Charles F. Binns—We can regard the subject of physics as the foundation subject of every day school. And, in general, is it not a case of the "survival of the fittest"? Most of you know that it is difficult to lead any student into the higher branches of science unless he has an acquaintance with German and Latin. I know of professors who decline to take students unless they have a knowledge of Latin, this being the groundwork on which every language is based. In my own work, in clay-working, a student must understand German. It seems to me that it is no choice that Latin is selected as the leading subject in scientific education.

CHEMICAL LABORATORY NOTES

BY PROF. CHARLES M. ALLEN, PRATT INSTITUTE, BROOKLYN

Science teachers sometimes lose sight of the fact that many educators do not concede to chemistry and physics study an educational value equal to that of mathematics and language.

This educational discount is generally placed on any study which devotes a considerable amount of its time to laboratory work, which is considered with more or less justice as not demanding an adequate amount of effort by the student. The student, however, is the best judge of an easy or hard study; and I believe the average student will declare that a year's work in science, as generally conducted, stands for a decidedly less outlay of mental energy than a year in algebra or in Latin.

If this is true, I think it worth our while to seek for the cause of the unfortunate estimate placed on science study and if possible, to remove the handicap. It is, I believe, the character of the laboratory work which has brought science in our secondary schools into disrepute among many educators. If we will bring our science into good standing, we must stop "fooling with test tubes and playing with *precipitates*." Laboratory work should be made more strenuous than it now is. Before a student or an educator will respect a laboratory course, he must see clearly that it demands strong, honest effort. If a teacher thinks that a student works as hard in his laboratory as in his classroom, let him make the announcement, "Today you will exchange recitation for laboratory work," and note the sigh of relief, and mark the contented smile that passes over his class. These evidences of joy are not due wholly to love of laboratory work, but are caused in part by the student's escape from the harder task of the recitation hour. The prevailing lax methods of conducting laboratory work and more specially the indifferent way of recording notes of experiments, are mainly responsible for weakness in chemistry and physics study.

The textbooks of chemistry with very few exceptions may be divided as regards their experimental provender into two classes.

First, *the flabby experimental book*. This is filled with a swarm of little, easy experiments which do not demand any decent amount of mental effort by the student. I can best illustrate by a typical experiment copied verbatim from a recently printed experimental chemistry. "Take a piece of ice. Note its properties. After crushing, heat in a 100 c.cm. flask. When all is melted, note its properties. Heat the water to boiling. Does anything escape from the flask? If so, state its properties. What are the three conditions of matter?" Now what is there in such an experiment that an ordinary boy or girl does not know before he tries it? You can not make a student respect such laboratory work as that. He will rightly conclude that it is a "snap," not worth his while to perform. Yet this book is published by a very respectable firm A. D. 1900, and will doubtless be pushed into some schools.

Second, *the devitalized experimental book*. Experiments in these books are uninteresting to the student, because they inform him just what is to take place even to the minutest particular. There is a host of such books on the market. I turn at random to an experiment in a chemistry textbook which, aside from its experiments, is a most excellent book. "Prepare some starch paste and dilute five or six drops with 10 c.cm. of H_2O. Dissolve a very small piece of I in alcohol and add a drop of the alcoholic solution to the dilute starch. The starch will be colored blue. The blue color will disappear upon heating the solution and reappear upon cooling it." Such an experiment has had the life squeezed out of it by telling the student all that he should find out for himself. He can write the requisite notes just as well before he has performed the experiment, and this he will proceed to do unless watched. This verification of results predicted in the book offers nothing to compel thought, nor does it really demand anything better than careful manipulation.

There is no experimental book that is perfectly satisfactory to a teacher. Consequently, the only thing to be done is for the teacher to make his own. This can be done without undue trouble by means of printing hectographed or mimeographed sheets with experiments, selected, modified or originated by the teacher. Whether such a list of experiments may be called the teacher's own is an ethical question I will not discuss. The advantages of such a system are so many and so great that it certainly will appeal to all progressive teachers who have not yet adopted it. For this system the following advantages may be claimed.

1 A teacher may incorporate into his laboratory work at any time any first class experiment he may come across. Such experiments are constantly appearing in the new books or in chemical journals, or in such conventions as this, or, best of all, may be originated by the teacher. He may thus select those experiments adapted to his own classes and to his own laboratory facilities. Thus he has at his command an elastic series of experiments which he may cut and trim, amplify and strengthen as he will. With such a system laboratory work may be made strenuous, up to date, and worthy of a student's best effort.

2 The teacher may in a sense regard such a collection as his own. Nothing is so alive as the product made in whole or in part by oneself. There is a pride and interest in working out to success such a collection of experiments. This interest will spread from teacher to student; and the class will be vitalized with the thought that it is doing something which comes directly from the teacher's hand and is designed specially for its own use.

3 By increasing or decreasing the number of experiments, a teacher may keep his laboratory work coincident with his recitation work. I prefer generally laboratory work on most subjects to come somewhat in advance of textbook instruction. In some parts of chemistry I prefer the reverse. By this method a teacher may arrange this as he pleases.

4 There is a marked advantage in keeping the textbook entirely out of the laboratory. The average student prefers to hunt up in the book the answer to a question rather than to rely on the evidence of his own senses gained in experimental work. By using one's own laboratory direction sheet, this paralyzing tendency in qualitative experiments is corrected, and independence is enforced.

5 I have found a decided advantage in issuing to my classes a few sheets only at a time. Thus the top of the hill seems to be in sight and more energetic work results. A boy likes to report "Out of sheets". I issue not more than half a dozen at a time.

The only practical notebook, as most science teachers have discovered, consists of detachable sheets fastened in some sort of binder. It is only with such a book that a creditable record may be secured from every member of a class. With it, the carelessly written notes may be detached and rewritten, and the teacher does not commit the educational blunder of forcing a student constantly for a year to view the results of his own carelessness. This notebook with detachable sheets is adapted admirably to the system of instruction sheets here advocated. Among its advantages the following may be noted.

1 In the exhausting labor of correction of notes, at least one third of the time is occupied in collecting, handling and distributing the notebooks and turning over the leaves to find the place for correction. This time is saved when one has at hand, in a bunch, the file of detached sheets to be corrected. But what a relief it is for a teacher rolling up such a collection to be able to take it where he pleases for correction and above all to possess the blessed assurance that these notes do not necessarily have to be corrected before the next laboratory period of his class.

2 It is only by using such a system that a teacher may be absolutely sure that independent work has been done, and that he can with a clear conscience certify such notes at the end of the year. There is no need of emphasizing the crying need of honest, independent laboratory work. This kind of work can be secured only by insisting that all notes shall be written in the laboratory, during the laboratory period, and that they shall not leave the laboratory except in the teacher's hands. Such notes should be written in ink, thus saving time and at the same time teaching the student the important lesson of making his first draft his final one. When a serviceable fountain pen may be obtained for a dollar, there is no need for penciled scribblings.

The notes detached from the binder and handed in for correction, when "accepted", I think it wise to retain for a month or a half term, or till examination time calls for them for the student review study. With these precautions the teacher may surely affirm that the notes are the student's own work. These notes may not look as neat, they may not be as elaborate, but elegant handwriting and beautiful sketches are not to be compared with true, independent work.

3 With the instruction sheets for each experiment bound so as to face the "accepted" notes for that experiment, we have at the end of the course a compact and complete record of all that was required in the laboratory and all that was done by the student. This is trustworthy evidence which, because it is easily examined, is accepted by the examiner as a record of real work truly done.

As regards the form of the notebook, I have found that a simple binder opening at the end rather than along the side is preferable. A large saving of laboratory desk space is thus secured; for the instruction sheet may lie on one cover that is leaned up against the shelf, which on most laboratory desks faces the student, while the blank sheet for the record may lie flat and convenient for writing. In this way, too, at least one half of the book is kept away from "acids, bases and salts" which occasionally float over the desk top.

The size of a binder may suit the teacher's taste and convenience. I have found most practical a simple cloth-bound binder

8½ by 11 inches, opening on the 8½ inch side. This has the eyelet holes near the two corners, and the sheets are bound in by long brass McGill fasteners. This is simpler, cheaper and better than any patent fasteners. These, I have found, either tear the sheets or get loosened by use. Any bookbinder ought to furnish such a binder in cloth, quarter leather, for 25 cents or less.

The sheets of paper used are standard letter size, 10½ by 8 inches. A single sheet of this size, by using both sides, I have found large enough for recording an ordinary experiment.

I prefer unruled paper. It is neater, and students should learn to use such paper. The sheets of the record may be made attractive by bearing a printed form, providing spaces for date, number of experiment and name of student at the top. A space occupying vertically a half inch may be devoted to "Required." This includes the title and a phrase describing the object of the experiment. I have found that a space of 2½ inches is sufficient for a concise statement of "Process." For a student to condense a description of the essential things done in an experiment, and limit it to this space, is both a valuable lesson in English for a student and a relief to the examiner. Of course, if more space is needed for any experiment, it may be taken by lining out the printed word "Process," and writing it in below. The remainder of the sheet and its reverse are devoted to "Conclusions." The writing of these conclusions can be made very definite by the answering of a rather large number of questions interjected in the direction sheet. These questions are lettered consecutively, so that all must be attended to by the student. These are scattered throughout the experiment, and are designed to draw attention to its more important parts and to insure that the student understands what he is doing and why he is doing it. Thus is avoided the mechanical following of instructions which is the bane of very much laboratory work. By the independent answering of a dozen or more searching questions, most of which he can not answer till the performance of the experiment furnishes him the requisite data, and many of which are rigorous enough to start some reaction in the gray matter of his brain, we may make the laboratory work strenuous enough to win the student's respect and to demand from him some honest, intellectual effort.

The preparation of these hectographed or mimeographed notes does not occupy so much time as might be supposed. A sheet can be written from copy and a hundred prints mimeographed in three quarters of an hour. A mimeograph, provided with file surface for stylus writing, may be purchased for $22.50. From this ideal printing machine may be obtained sheets neat and thoroughly satisfactory. The hectograph may be used and is very cheap, though it is not as good. If the right kind of ink is used, and the printing is done rapidly, 200 copies may be taken with the hectograph. Here is a sample of the first and the 276th copy of a hectograph sheet, and the latter, as you see, is legible enough for practical use. These printing outfits may also be utilized for examination and other similar work.

I have no hesitation in affirming that the introduction of this system of chemical laboratory notes will be followed by a marked increase of interest on the part of the student in his work, and will do much to bring to a place of honor the work in the chemical laboratory.

Prof. E. N. Pattee—I agree with the paper of Prof. Allen, that the weak point in chemistry is in the laboratory work. Textbook work is well done, but the emphasis should not be placed there. I have yet to find a student who thinks that the work done in the laboratory is as effective as that done in recitation. If science teachers are to be recognized, we must have as good work done as is done in algebra, mathematics, geology, etc. Prof. Allen has not overestimated the importance of strenuous laboratory work.

Prof. Burchell—I appreciate the work of Prof. Allen. There is a question I want to ask. About 15 years ago, when my work was shorthand, I began a system similar to his; but, when I began to take up this work of science, I was reluctant to use as my own that which belonged to other textbooks. I want to ask how the authors feel toward those people who follow this plan of making up laboratory manuals of their own? What are our privileges and limitations in selecting that which we think is best from other sources? Is any injustice done to the people whose textbooks we use so freely?

Prof. Allen—I think, if we examine a list of 20 books, that we will find that four out of five of the experiments are common to all chemistry manuals. No fault is found in these cases, and the writers of the books are not infringed on in any way. No law is violated nor any copyright. We must remember that the material is not selected for publication, but simply for class use. If desired, it may be quoted with proper mention of the source.

HOW TO MEET THE PROBLEM OF TEACHING PHYSICS BY THE LABORATORY METHOD IN SECONDARY SCHOOLS.

BY FRANK M. GILLEY, CHELSEA (MASS.) HIGH SCHOOL

Headmasters and others who have to do with the administration of secondary schools are beginning to question more and more seriously the necessity of special provision in time and division of classes for laboratory courses in physics. "Why," they ask, "should not a class in physics be of the same size and subject to the same hours as one in English or mathematics?" In some cases the questioning has developed into more or less active opposition to extended courses in science for which such special provision is demanded in the way of hours for study and recitation. The demand for smaller classes also has gone far to place science on a plane different from, and lower than, those occupied by other studies in the estimation of various school authorities.

When, however, such authorities proposed to put physics on the same basis as algebra and Greek as far as time allowance is concerned, teachers called the plan at once an absurdity. "With 24 or more in a section," they say, "a 40 minute period would allow us less than two minutes to each pupil." This comment touches at once the difference between the algebra class and the physics class. The algebra class is taught more or less as a whole, while the physics teacher looks at once to the amount of individual instruction he can give to each pupil. If the physics class could be taught as a whole, then, it might at once be put on the same allowance of time in the curriculum as the other studies. Many teachers will be inclined to say offhand that it can not be taught as a whole because the pupils will not "keep together." But why should they not be forcibly held together as firmly as are pupils in Latin? That a pupil could perform the work of an ordinary laboratory exercise in the same time he occupies in his Virgil or Caesar class, few teachers would be disposed to deny. The problem is to get the entire class to grasp the exercise, set up the apparatus, and perform their work without waste of time. Experience has shown that study by the pupil of his textbook or laboratory manual before coming to the class is but slight help to that end. Neither does it always serve to have the teacher explain the construction and working of the apparatus beforehand. The only effective way of accomplishing a short hour laboratory exercise is for the teacher to indicate or perform each step of the work, and let each pupil follow him, performing each step according to directions. At first glance this may seem merely formal and a pure waste of time; the truth is, however, that it saves completely all the preliminary helpless handling of the apparatus which two thirds of the class always go through when left to a set of printed directions, a process over which enough time is often wasted to perform an entire exercise.

The teacher should begin by giving directions for the form of record, including name and date if desired, giving special care to the description of apparatus. For the last he should make a diagram on the blackboard and exhibit the apparatus itself, or perhaps an enlarged model. He should then give the directions for the experiment, whenever possible holding the apparatus up before the class and performing each operation as he describes. If the experiment is, for instance, "images in a plane mirror at an angle of ——", he will begin his directions for the exercise proper with some such directions as these: "Lay a sheet of paper with one corner at the center of a page of the notebook in this way. Set the two mirrors along the edges of the paper, so that they meet at the corner in the center of the page. Look in the mirrors. Hold a pencil between them. Count the images that you see. Cover one mirror with a sheet of paper. How many images disappear?" At this, or at any convenient point, directions may be given to write down the method of the experiment as far as performed, together with the observations taken. The teacher meanwhile may go about among the pupils, looking at their work enough to detect any prevalent mistakes or omissions. My own experience has been in this particular exercise that half the class will at some stage of the work have their mirrors more or less off the lines. If at the beginning I notice one who has made this mistake, I say to him without calling him by name, and loud enough for the entire class to hear, "Are your mirrors on the lines?" If the rest of the class do not at once correct the mistake, call the attention of the entire class to the error and give directions for its correction. By this method most of the mistakes to which a laboratory class is liable may be corrected with little or no individual attention to the pupils.

The directions for the exercise might then continue somewhat as follows: "Draw lines in the books along the edges of the sheet of paper. Remove the paper. What is the angle at the corner? Replace the mirrors. Complete the title at the head of the exercise to read at an angle of 90°." At this point the teacher may find it best to go about the class and draw an arrow in each notebook between the mirrors. If the parallax method is to be used, the directions would continue: "Place a pin at the head of the arrow and letter the point A. Letter the right-hand mirror M. Locate the position of the image you see in it by placing a long pin behind the mirror in such a position that the image of the long pin seems to be a continuation of the image of the short pin. Move the head sideways. Do the image and the long pin keep in line? If not, try the long pin nearer the mirror or farther away from it." Of course the pupil is not to be reminded of the fact that the large pin must be as far behind the mirror as the short pin is in front of it, but the suggestion, "Try it a little nearer" or "a little farther" to a pupil who is in error is perfectly permissible. As a teacher goes about the class, his eye, moving past the desks in succession, will detect at a glance the one who must try again.

"Make a circle round the point of the large pin," the directions continue. "What does it mark the position of? Letter it A." Perhaps beyond this point the questions need not be quite so minute, but this the teacher may determine from the character of his class. Opportunity should be taken now to inspect the work, praise it whenever possible, and assist those who always need assistance. The very rapid pupil, or perhaps one who is trying to "show off," will very likely have made some error and have to go over his work again. In most cases it is better that he should waste his time than that he should call the teacher away from the class to answer his conundrums. If time remains, dictate problems, some to be handed in at once, some to be done outside the class. Let those who finish the exercise first, study the diagram in the notebook and find some rule by which the third image can be located. Ask, for instance, how far it is behind the righthand mirror. How far behind the lefthand mirror. What happens to the third image when the angle between the mirrors is decreased. Suggest a way of setting mirrors at right angles. Draw lines at right angles and locate the third image of a point between them.

It is easy to continue along these lines with experiments that will be found useful as supplementary or review work on this exercise. Let the pupils fold a sheet of paper making the crease from the corner for an angle of 60°, and setting the mirrors by it at that angle, and count the images in them of an object placed between them. Let the rapid workers experiment with angles of 45°, 30°, 22½°. Arrange the results in some such tabular form as:

Number of images	Angle between mirrors	$\frac{360^\circ}{\text{angle}}$	Number of images + 1

In the case of very young pupils, if the work outlined is divided into two or more exercises, in one of the cases described, set between the mirrors a card a centimeter high, marked on one side. Then all the images of the mark will be reflected first from the mirror facing the mark. By these methods that I have been outlining, it becomes a simple matter for the teacher to establish at the beginning whatever connection there may exist between the exercise he is taking up and the exercise that preceded it. If the exercise following the one just described is on parallel mirrors, let the class begin by decreasing the angle between the mirrors from 45°, five degrees at a time, and reporting the effect on the number of images. Finally, setting the mirrors parallel, let them locate by parallax method a few images in each mirror, and try to find a rule for their positions.

The first objection that will be urged against this method for laboratory classes is that it is mechanical. In theory it may appear so; but one has only to try it to find in every exercise a point is reached before the end of the hour when the pupils may be left to finish the exercise by themselves, and often they will have time left to repeat it, or try some variation. Often too there is time left for a short explanation or experiment by the teacher, or problems and oral questions—and problems dictated at this time to be done outside of the class are often a valuable reminder to the pupil that there is another lesson coming. The teacher working along these lines is left free, instead of being at the call of every upraised hand, to pass around the class and see for himself whether the directions are being obeyed or not, and give directions for the remedy of any prevalent mistakes. He may do particularly effective work in criticizing the form of record. Such a criticism made without calling the pupil by name will usually take effect on half the class.

It is better to give 80% of your pupils an hour's instruction than to give 100% of them one minute. The choice is between the method we have been describing, that of one teacher one class, or the more common method of one teacher and one pupil; for, no matter how small the class, the individual method leaves out all but one. The method of having all the class at work at once, each on a different experiment, is the worst of all. It saves apparatus to be sure, but it wears out the teacher, who can not handle his class as a whole on any point whatever during the hour.

In more complicated exercises the method I have been describing will be found equally effective. Let us apply it, for instance, to the Wheatstone bridge experiment. Suppose the class already acquainted with experiments on the fall of pressure along a pipe carrying water, and the flow of water from a point of high to a point of low pressure. Suppose them, too, to be familiar with the fall of electric pressure along a wire carrying a current, and with the fact that this fall of pressure increases as the resistance increases. When they are supplied with the usual apparatus, and a one ohm wire or coil, and a wire the resistance of which is to be measured, give them directions step by step, for connecting the battery, galvanoscope, and the known and unknown resistances. After each step is indicated, lines and letters should be added to the conventional lozenge-shaped diagram of the bridge, and to another diagram showing the form of bridge actually used. It is well to have the unknown resistance a little more or less than an ohm, so that the slider is near the center of the bridge when the galvanoscope shows no current. Tell the class to move the slider within 20 cm. or so of the righthand end of the bridge-wire, and ask them which way the N end of the galvanoscope pointer turns. Then let them move the slider to the other end of the wire, and then try to find the point that is at the same potential as the junction of the known and the unknown resistances. When this point is found, let them record the position of the slider. Now take the data of some one pupil and work out the unknown resistance on the blackboard, and the pupils can at once do the same with their own data.

Up to this point the class has worked together as a unit. Now let each go his own pace. To keep them profitably busy, use a two, five, or a one half ohm wire as the known resistance, and let them find whether the computed results for the unknown resistance agree. Let them find the resistance of a cell, a battery carbon, a miniature incandescent lamp (cold), a telegraph sounder, a telephone receiver, a transmitter, the primary and secondary coils of an induction coil, a commercial transformer, an electromagnet, coils of galvanoscope and galvanometer, ammeter, voltmeter, a dynamo armature and field, a thread of mercury in a tube (old standard ohm). If all this is not enough to keep an eager pupil busy, try interchanging the battery and galvanometer. Other exercises might take up specific resistance, and the effect of temperature on resistance. It is only necessary to get the class as a whole started on the right track, so there will be no need of telling each pupil separately anything that can be told to the class as a whole. Before long a class that has been taught by this method can safely be left to itself in the performance of exercises described in the textbook as the training they have had in following instructions dictated to them step by step will serve them well in following printed instructions. Indeed, the necessity for instruction varies greatly with the nature of the subject, and the same is true of laboratory work itself. The management of classes in physics would be greatly facilitated if the fixed divisions of the time into lecture, recitation, and laboratory work could be done away with. In such a subject as light, laboratory work should occupy a large part of the students' time, while the laws of motion may be studied with scarcely any.

While these matters I have brought up, I have meant to apply chiefly to large schools, still, where the classes are 10 or less, the method of instruction may be modified in the case of a few exercises in which it is possible to make one or two pieces of apparatus suffice for the whole class. In such cases the class may gather around a good-sized table, and one pupil after another perform the essential parts of the experiment. The apparatus should be assembled and taken apart several times, and the pupils should both do it and see it done. Each pupil may take his own readings. Suppose that, in testing a thermometer, only one steam boiler is available. This should be steamed up while each pupil is taking the melting point of ice. Then the thermometer should be warmed in the hand or mouth (perhaps incidentally taking the temperature of the body), and put into the steam dome of the boiler. While waiting for their turn, pupils may read the barometer, figure what the true boiling point should be and make a diagram and description of the apparatus. One composition of force board will keep a class of 10 busy, the dynamometers or spring balances being held in position by clamps. After all have made readings and diagrams of the apparatus, some changes may be made in the forces and their points of application, and a new case recorded.

If we are to give physics its place as the chief and fundamental science study in large schools, there are needed, in addition to the reforms we have been discussing, convenient laboratories, suitable apparatus and trained teachers, who are allowed time both in and out of school for preparation. Assuming that there has been allotted to the physics teacher sufficient laboratory space (and this is far greater than is generally provided by the architect), the next problem is to obtain good working apparatus, one piece per pupil for each experiment. As an appropriation sufficient to provide apparatus for the entire list of exercises in the course is seldom made at one time, it is generally best to use the money as far as it will go in procuring enough apparatus for a few exercises and teach by the laboratory method as far as the apparatus will allow. Since some of the simpler apparatus may well be made by the teacher, a part of the appropriation should be spent for tools and raw material. The cost of stock for a set of apparatus for 25 quantitative and several qualitative experiments covering the subject of light is less than $1 a pupil. And this estimate includes a few things, lenses, prisms, etc., which the teacher would not dream of making. The lack of equipment should not stand in the way of an *introduction* of the laboratory method of teaching physics. In asking for an appropriation, the argument might be made that a city or town that can afford to employ a science teacher can not afford to fail to supply that teacher with tools of his trade.

However small the annual appropriation, a constant attempt must be made to increase the equipment, and in certain portions it should be complete, with apparatus for the individual pupil. Whatever is the size of the school, there should be an appropriation for physics just as surely as the seasons come round. It is not the best course to spend this all in one lump sum. Several times a year the way should be open to buy supplies as they are needed. Is there a large business anywhere in which the year's supply is contracted for and purchased at one time? Some department of the national government perhaps. You all know what is the effect there on the cost of production and the time of completion.

The class laboratory method, then, requires a complete equipment for any *exercise attempted*, spare periods during school sessions for preparation, freedom from petty responsibilities before and after school and a laboratory assistant. The setting up, clearing away, preparation and repair of apparatus, and, during an exercise, the distribution of materials, much of the cleaning of the laboratory, arranging for lecture demonstrations, and correcting exercises can be done as well by an assistant costing from a half to a tenth the salary of the teacher, who is left free for more and better work. If much of the routine work of the laboratory is drudgery, is it profitable to employ a $1000 or $2000 drudge? To test and put in order the apparatus for the slide wire exercise as I have described it, to prepare the known and unknown resistances, several hours are required of work that an inexperienced assistant can do after working a few minutes with the teacher. The teacher should be employed to teach and do such work as can not be done by assistants. The colleges have for years made profitable use of laboratory assistants. Many a teacher drawing a salary of $2000 to $3000 occupies half or more than half his time in doing what could be better done by a $300 assistant. Is it strange that physics teachers have so little time to study?

The teacher must know his subject. He must read the scientific and mechanical journals, glance through the magazines in search of popular presentations of new discoveries, ever striving to get a broad glimpse of the field traversed by the progress of science. He can not however study experimentally the fundamental principles of physics, and obtain firsthand means for illustrating his talks and lectures unless he has acquired some skill in the use of tools. Newton made his own apparatus. Faraday wound and insulated his wire. That, to be sure, would be poor economy today, but there are other things as useful as insulated wire that you must prepare yourself. The simplest portions, and by that I mean the very simplest of the tinsmith's, gasfitter's, blacksmith's, machinist's, carpenter's, glass-blower's and manufacturing optician's trades are all useful. How much more real are lenses to you and your classes if you have one you have ground and polished! How simple the principle of the thermometer becomes, if you blow and finish a crude model before their eyes! You will find after you have acquired some mechanical skill, that the apparatus always works, and time-worn apologies for failure are things of the past. A broken galvanometer suspension means 10 to 30 minutes time at the bench to make good, in place of several hours of correspondence, and days of waiting for the apparatus to be sent to a distance and the damage repaired.

In closing, let me remind you that in demanding adequate equipment and time on the program for physics, you should call attention to the fact that home work can be assigned after the first lesson, much of it of a kind, problems, questions, diagrams, plotting, etc., that is definite and is easily corrected; and the pupil's application to his work and his progress can be tested from the very start.

Further, you are demanding a place for a study that should be preliminary to all other sciences. Without a ready knowledge of physics, meteorology is little more than a landsman's guess of the weather, astronomy a popular and meaningless description of planets and stars, and chemistry is unnecessarily difficult and in portions unintelligible.

Prof. Osborn, of Olivet College, quotes the leading physicist of this country as saying that, to train his powers of observation and classification, let the student study natural history; to give care in experimenting and convince the student that nature forgives no errors, let him enter the chemical laboratory; to train him in exact and logical reasoning, let him study mathematics; but, to combine all this training in one, let him study physics.

Section B. BIOLOGY

IDEALS IN TEACHING

BY PROF. ALBRO D. MORRILL, HAMILTON COLLEGE

[*Abstract*]

Among the ideals which have dominated students of natural history, at different times, only three need our attention, on account of their prominence in modern teaching of the natural sciences. The first is classification, or taxonomy, an important branch of knowledge; but, when it absorbs the whole attention, as it did less than 20 years ago, in our schools, it gives but meager results, as some of us know by experience.

The plan of mounting and labeling plants and animals was later largely replaced by the study of types or examples. This change was greatly aided in this country by Huxley and Martin's *Elements of Biology*, since followed by scores of other works. This led to a more thorough understanding of the structure of plants and animals, also of their relationships, than the examination of the external form with a view to classifying them. This study of types has been associated in teaching with evolution, though historically the latter is much the younger. In the study of evolution, variations in domestic and wild forms of animal and plant life and their adaptation to changed or changing environment and struggle for existence divided the field with embryology, where, working on the basis of von Baer's law, the attempt was made to reconstruct the ancestral types of the different groups of plants and animals. Today we may find these ideals, together with the physiologic one, separately or combined with each other in ecology.

Much might be said in favor of emphasizing the physiologic ideal, as plants and animals must be studied as living organisms to gain a full understanding of the many problems involved in classification and morphology.

As we always have the poor with us and often without any fault of theirs, so we have teachers of science whose highest ideal, in practice at least, is to get as many pupils through the examinations as possible, and to whom the teaching of old examination papers takes the place of something better. I said it is not always the teachers' fault, for they are often given insufficient time or equipment, and real science is not a subject to be swallowed whole and disgorged in chunks in an examination. Then there are cases where the school authorities, teacher or pupils, or all, may be unable to see any use in a subject which is not immediately useful and capable of being coined into dollars.

There are, unfortunately, among the university-trained men who are teaching in high schools or colleges, too large a number who consider the work of teaching a bore and who devote their time to their own researches. It is not intended to decry research, as it is of the greatest importance, but too great a devotion to it.

In elementary work, at least, the pupil is of much more importance than the subject; but there are those who are more disturbed if they can not present the subject symmetrically than they would be to know that they were developing in their pupils a positive hatred of the subject and the worst methods of study.

There are two principal methods of conducting laboratory work and many variations. In one, lectures and demonstrations precede the work of the student, and the time in the laboratory is devoted to the verification of the outlines furnished or of reference books consulted. In the other observation by the pupil, aided by brief and simple questions, is made the preparation for consulting reference books under the guidance of a careful instructor, who aims to help the pupil to help himself rather than to tell him that which he can see with his own eyes. This is followed by a class conference, where comparisons are made and notes taken to help in looking up the disputed points. Then the instructor can, by demonstrations and explanations, supplement the work of the pupil. Thus the pupil, with a nucleus of his own carefully sifted observations and with the interest generally aroused, attracts facts as a magnet does iron filings. The latter method requires however an experienced teacher to prevent discouragement and to develop the pupil's self-reliance.

The pupil who takes up a science for the first time after reaching the age of 15 to 19, as we often find the student doing in college, has in too many cases been taught to be the passive recipient of the ideas of the book or instructor. The book is to him a fetish. Many of us have undoubtedly seen some of these devotees searching (surreptitiously) for drawings or descriptions in some reference work and sometimes handing in pictures of an animal of a different species from the one which they were supposed to study.

The extreme method used by Agassiz in his training of investigators has unquestioned advantages in killing off weaklings, but is of little value in an unmodified condition for younger pupils. The pupil needs judicious guiding rather than driving or being left to his own resources. The teacher should be a lover of nature and devoted to truth for truth's sake; at the same time, he must not be too exacting of the beginner. As the work advances, more and more must be expected of the pupil; better description and more accurate drawings. One of Agassiz's mottos, "Study specimens and refer to books," gives in a nutshell one of the great principles of zoologic study.

It is a pleasure to watch each pupil for some glimpse of real interest and to make it easy for him to take a second and many succeeding steps toward independent work. Develop his individuality whenever possible. The laboratory and its appliances, together with the instructor, should be simply aids to individual development.

The influence of a single enthusiastic student in a class, who has good methods of work, is many times more powerful than that of the instructor. The more good workers in a class the harder it is for the indifferent to remain uninfluenced. The advantages of summer schools for the best student in a class of college students can hardly be overestimated, as during the succeeding year they are able to stimulate their associates by the better work and broader views which they bring back with them.

In the time usually allowed for zoology but few types can be studied; but the more or less superficial examination of many related forms and anatomic preparations as soon as the study of each type is completed will prevent the narrowness too often associated with the study of types alone.

Whenever possible, a living representative of each group, if not the animal dissected, should be examined; and for this purpose simple aquariums and vivariums are becoming more necessary.

In a few places salt-water aquariums are successfully maintained with the advantage that the habits can be studied by the beginners, and material for research kept constantly on hand.

There are differences of opinion as to whether the elementary work in biology should be the broad and somewhat superficial examination of many forms before the minute and rigorous study of the few or the methods should be exacting from the start.

The tendency, as you well know, is toward the so called natural history method, with less use of scalpel and microscope in the high schools. In all work personal observation takes the first place, followed closely by comparison and experiment. The spirit of investigation, with its judicial consideration of all the facts, should not be ignored, but, whenever and wherever possible, cultivated to the fullest extent.

Should we attempt to train botanists, zoologists, or physiologists? If so, we can but fail in most of the cases. If we are able to strengthen the enthusiasm, help to form correct methods of working and develop fair-mindedness, the few who go on to advanced work will be able to choose, each for himself, the particular field of work. There are dangers, on both sides, in too little and too much help for the learner. There should be no sharp transition from learning to investigating, be it in science or in life.

Prof. H. R. Linville—I am much impressed by one point of Prof. Morrill's, that is, the mistake of giving laboratory work wholly into the charge of assistants. The instructor who gives the course should also have control of the laboratory work and of the assistants.

Prof. A. J. Grout—May I ask whom Prof. Morrill means by assistant?

Prof. A. D. Morrill—A graduate assistant is what I meant. I have such an assistant that does all the work that can be given to him. He is there most of the time, and it works very successfully. I have studied his methods, and am satisfied with his results in botany.

Prof. N. A. Harvey—One thought came to me as Prof. Morrill was speaking about the changing ideals in science teaching. Perhaps I would better illustrate it by carrying the matter of ideals into what I have seen applied in recent years. The time the reports of the X-rays experiments were being applied, college graduates, high school teachers, normal school teachers were all teaching X-ray experiments. And then wireless telegraphy became the fashion, and college graduates, normal teachers, and high school teachers devoted their time to that branch of science. At the southern end of Lake Michigan are pronounced specimens of sand dunes. Scientific men began to study them; then high school teachers knew about them; then the teachers in the high schools, normal schools and elementary grades began teaching sand dunes. All schools began studying sand dunes. They occupy a large part of the work in geography. It may be the proper thing to do; but I question whether that is the best ideal to set up and make the basis of the study of geography. Somebody in the Chicago University made special study of the Chicago plain; but since then, the university teachers, high school teachers and normal teachers are all studying the Chicago plain. I doubt much whether this ideal we set up is the best thing to do, and that everything we have done before should be discarded and the new thing taken up. Dr Cowles published an excellent paper in the *Chicago Magazine* on plant societies. Teachers are studying plant societies; universities, high schools and normal schools are studying plant societies. Whether the thing is eminently proper and should be taken up and made so much of, and whether the things we have been doing previously should be so discarded, I will not undertake to say. It seems to me that we have excellent opportunities to use common sense. Science means common sense.

Prof. C. W. Hargitt—I want to say a word regarding one point, namely, the importance of a unified and harmonized outlook in the work of science teaching in college and schools. The paper called attention to the fact that sometimes the departments become differentiated, and perhaps lose their common point of view: the department in botany perhaps, or in zoology, or in physiology, where, exercising his interest in research along one special line, and ignoring nearly every other part of the biologic work, the teacher may make an unwise distinction. I believe that both for the college and the high school, the idea from the point of view of general biology is a very valuable one, and one which we ought not to discard. And the teacher can be trained with the ideal that there are fundamental results to be obtained, and that his teaching may not lose sight of that principle. We can get more harmonious work than if we start out with the idea that physiology is the only thing in biology; that botany is the only thing in biology, etc.

Now it seems to me that the point raised by Prof. Harvey is not a very serious matter, providing there is a broad foundation back of it, i. e., that there is more in physical geography than "sand hills;" that there is more in geology than the "Chicago plain." I suspect that one of the troubles is that there is lack of proper balance. That is a tendency in these days. However, when we are brought face to face with the sand hills, here is something concrete and directly at our hand. We don't have to travel to study. The fault in the past in such work is that teachers have been led away into Europe, the Adirondacks, the Rockies to get illustrations; and, when the college professor brings them face to face with these things at their own door, they have lost sight of the balance—the relation these things sustain to the entire realm of nature. The danger is not in taking lessons from things at hand, but in not having a foundation back of them that will put them in their appropriate relations. The fault is not in the system, but in its proper adjustment and application.

Prof. F. E. Lloyd—It appears to me that educational fads are not altogether to be deplored. In following a fad for a time, we may at least believe that a teacher gets many new ideas, becomes acquainted with new points of view, and with new lines of thought. A teacher who may be accused of following a fad may not at any rate be accused of being asleep; and on the whole he is better off for the stimulus. We may have no doubt that the pendulum will swing back again, leaving little or no harm done, and, not improbably, considerable good.

Prof. Morrill—We can help the teachers in high school by suggestions. Suggest changing, and at one time giving wireless telegraphy, and at another time something else. The board may be very anxious that pupils shall understand wireless telegraphy. In that case I should use every effort to persuade the board to let me have more time, and use it for other purposes, and more than that get more money out of them for what I considered the real thing.

Prof. E. B. Callahan—The reason why teachers are so liable to copy the work done by advanced teachers is that they have had poor preparation. As you know, laboratory work in the sciences is a new thing. I think you will find that the teachers of the high school are giving you the highest kind of praise when they copy you; and they follow the investigation of the sand hills because they think it is the best thing to do. The teacher who has a good preparation before he gets into the high school can see the relation very well and is not so liable to copy.

THE TRAINING OF A SCIENCE TEACHER FOR SECONDARY SCHOOLS

BY PROF. N. A. HARVEY, CHICAGO (ILL.) NORMAL SCHOOL

It is easy to say what a teacher should be. He should have all of the virtues and none of the vices of the greatest men. The dignity of Washington, the generalship of Napoleon, the wisdom of Franklin, the statesmanship of Webster, the sympathy of Lincoln, the eloquence of Phillips, the scholarship of Gladstone, the business ability of Morgan, all of these things enter into the make-up of the ideal teacher. But, when a man is found who possesses any small proportion of them, he becomes unavailable for teaching at $60 a month, and is made president of an insurance company, or railroad, or a trust. So our teachers are not and will never be ideal teachers.

In a high school the teachers must be the very best that are available. I feel sure, notwithstanding the prevalent opinion to the contrary, that the high school period is the period of the greatest influence in the life of a pupil. It is a more important period than the period of elementary education, for it is at this time that the outlook of the pupil on life becomes enlarged beyond his immediate surroundings, and he begins to plan for his life work and to adopt life policies.

A teacher of science in a high school ought to know three things: first, his subject-matter; second, the psychologic movements involved in learning the subject; third, the principles and the art of teaching.

No one questions the necessity of knowing the subject. No one admires the fulness and clearness of information that some teachers possess more than I do, though I think there is a tendency at the present time to lay so much emphasis on it that we are inclined to exclude other things of equal importance. Other things being equal, the greater amount of knowledge that a teacher possesses, the better he will teach. It is an evident impossibility for a teacher to know the details of his subject throughout its whole extent, but he must have such a knowledge of it as to furnish a background for the particular phases of it that constitute the material for class study. His knowledge must be much more extensive than he expects his pupils to have after they have finished their work with him. There is no better way of learning a subject than by teaching it. and every teacher must be in the attitude of a learner as long as he teaches. I would suggest a possible error, though there may never be any occasion for the caution I present. I question the wisdom of a teacher carrying on a line of study that is foreign to the work of his class, or that is only remotely connected with it. There is always so much connected with the subject that the class is studying that the teacher does not know that there is abundant opportunity for the exercise of all his powers, and his study is then directly beneficial to his class. So I should not expect a teacher to know every fact in the whole range of experience before beginning to teach. A part of his energy would better be devoted to something else. The teacher of botany must be something more than a mere botanist. He must be a teacher, and he must be a man.

We have heard much in recent years of the necessity for the teacher's being an investigator. The justification for this opinion is the belief that research work has a greater educational effect on the mind of a student than the ordinary acquisition of knowledge. It can not rest on the assumption that there is not already sufficient knowledge in the possession of the world to furnish material for teaching, nor that the teacher has already learned all that is known in the whole domain of science.

I believe as strongly as anyone in the value of research work. I would have every exercise an exercise in research or productive of the same kind of value. This is easily possible if the teacher keeps textbooks, reference books and lectures out of the way of the class till they have had an opportunity to exercise their powers of investigation on the problems that the teacher sets before them. Where a teacher lectures to his class about the subject yet to be investigated in the laboratory, or assigns lessons from a book before laboratory work on the same subject is undertaken, none of the value of original investigation is possible. But I find this plan recommended in some books of high reputation.

On the other hand, some teachers in high schools are so imbued with the spirit of research that they set their high school students to work on research problems, believing that thus they are conforming to the most progressive ideas of education. To students of this age, with no more training in methods than they have had and no more knowledge of what others have done and said in similar lines than they possess, the conditions are identical with that of a class under the instruction of a teacher who is wholly ignorant of the subject of instruction.

The difference in the two cases is simply this. In the first case, the teacher knows what the pupil is trying to do, what result he expects him to get, why he wishes the pupil to do the work, and the place in the scheme of instruction that the work occupies. The pupil is kept from doing useless things; wasted energy and positive mistakes are avoided.

For three successive years I taught two classes in physics. One was a class of high school graduates who had studied physics with textbooks in hand and in laboratories of various degrees of efficiency. The other class had never studied physics. The two classes were nearly of the same size, same age, used the same laboratory, same guides, had the same teacher, same apparatus, same exercises. In about seven cases out of 10 the class that had never before studied physics obtained a result that was more nearly accurate than was the result obtained by the high school graduates. The recurrence of this phenomenon for three successive years, under circumstances so peculiarly favorable for comparison, seems to justify the statement that the effect of textbook study in connection with a laboratory is to diminish the ability of pupils to obtain accurate data for use in the derivation of laws. I feel sure that textbook study in biology will have a similar effect, though the proof of the proposition will be more difficult to obtain.

This discussion has somewhat encroached on the discussion of the other elements in the preparation of the teacher, for I believe that no one who has made a careful study of the content of the subject and the principles of teaching will be led astray to the degree that I have indicated. At least it seems to me that we have in the above discussion an example of the necessity for the preparation of a teacher in other things than subject-matter.

Within certain limits, all minds act alike. They have generic characteristics in common. There are general laws of mental action that lie at the basis of all our attempts at education. Education would be impossible if it were not for this common basis of thought. A teacher, whose business it is to incite the mind to act and to employ its self-activity, must from the nature of the case know what are the laws of mental action and growth. It is not enough to know in a mere theoretic way what psychologists have formulated concerning the operations of the mind. It is necessary to know how to bring the mind of the child into the presence of the subject-matter in such a way that its activity shall be aroused, and growth result.

This is the thing which makes the difference between the teacher and the mere scholar; between the artist and the artisan in school work; between the one who looks at the logical development of the subject and the one who sees the psychologic movement of the learner; between the one who teaches the subject and the one who teaches the child; between the one who gets his methods from a book and the one whose method is determined by the mental movement involved in education. The day has gone by when it is possible to maintain that knowledge of the subject is sufficient preparation for teaching it. There is just as much necessity for the application of pedagogic principles in the high school as there is in the elementary school.

Granting that good teachers do not just happen, we must allow that there is necessity for preparation. There are several ways in which preparation may be made. There are normal schools whose sole aim is to prepare teachers for their work, and they seem to be justifying their existence. As a strictly professional school, the normal school, from its very nature, takes precedence of all other kinds of schools for the preparation of teachers. The thing that a normal school undertakes to do is as necessary for the training of a high school teacher as it is for the training of a grade teacher.

It is commonly believed that the limitations of normal schools render them incapable of training teachers for the high schools, and that they should limit their efforts to the preparation of grade teachers. There is some justification for this opinion. In my own experience as a teacher of science in a normal school, I am unable to call to mind three teachers whom I could conscientiously recommend as teachers of science in a first class high school. It is true that many of my former pupils are teaching very successfully in high schools, but they owe little to the normal school for preparation in their special work. This condition is not inherent in the constitution of a normal school. The great demand on normal schools for the training of grade teachers and the relatively small number of teachers in any one subject demanded by high schools have rendered it inadvisable for normal schools to lay emphasis on the high school work. I think it will be admitted by everyone that, as at present organized, normal schools do not give sufficient preparation for the teachers of science in high schools.

The next thing is to seek for teachers that have been trained in colleges and universities. This does not constitute an ideal preparation for the teaching of science. The college-trained teacher has some very serious limitations. In the first place, he is likely to be so wrapped up in the matter of his subject that he teaches the subject rather than the pupils. He is unconscious of the fact that teaching is anything except the imparting of knowledge. His teaching is likely to partake of the nature of the pouring-in process. He looks at the subject from the standpoint of adult logic instead of child psychology. His methods are likely to be copied without serious attempt at adaptation trom the teachers in college; and in many cases these are known to be very poor models to copy from. In fact, in the absence of knowledge of the principles of pedagogy, it is a serious question if the great amount of detailed knowledge of subject-matter that he is popularly supposed to possess, and which is generally regarded as the one redeeming quality of a college-trained teacher, is not a positive disadvantage instead of a help. Comparing the college-trained teacher with a normal-trained teacher, it is a choice between two evils. Given one of the smaller high schools, in which one or two teachers do most of the teaching, and each teacher teaches seven or eight different subjects in a day (and this represents the greater number of high schools in the country) and I think the normal-trained teacher has proved himself decidedly superior. Where the school is of such a nature that the teaching of one person can be confined to a single subject, the limitations of a college-trained teacher are not so apparent. But so serious are they that I have been reliably informed by high school principals of much experience, that they expect, as an ordinary thing, the first two years' teaching of a college-trained teacher to be a failure. I suspect that every teacher who looks back at his first two years' work and who has attained a recognized proficiency in teaching, will be willing to acknowledge that two years are a low estimate.

It is true that the last few years have shown a rapid increase in the number of college-trained teachers that have been brought into the high schools. Observation of the fact in four states has indicated to me that this has not been from a spontaneous recognition on the part of school boards or school principals of the superiority of college-trained teachers, but has been brought about by a kind of influence on the part of universities of scarcely a legitimate kind, in refusing to place high schools on an accredited list unless they were provided with college-trained teachers.

There are three alternatives, or perhaps I ought to say four, by which better trained teachers may be secured. Two are at present available, and two need a modification of agencies already existing. First, normal schools may modify their constitutions in order to meet the demands for high school work. The plan at present under consideration for the Chicago Normal School is that the present two years' course shall be distributed over three years and shall be required of high school teachers just as it is now of candidates for the elementary schools; but in this distribution, there is an opportunity for the candidate to carry on a special line of work two hours a day for two years in the subject he may wish to teach in the high school. If that is biology, for example, there may be a proper division of this time among the following groups of subjects: technic, including the theory and practice of microscopy, microtomy, photography and projection; second, systematic botany, morphology, physiology and ecology; third, systematic zoology, morphology, embryology and osteology. The methods may include laboratory work, textbooks, lectures, readings, recitations, with special attention to the subjects that constitute an ideal high school course, and the psychologic movement involved in scientific teaching. It is not likely that this plan will be adopted. The additional equipment and expense would not be very great, but the number of teachers of biology demanded by the needs of the Chicago high schools is so small that it would be scarcely worth the effort.

The second plan is that universities shall so modify their courses in pedagogy that there shall not be the absolute divorce which now exists between the theory of education and the practice of teaching. So far, the pedagogic courses of universities have not seemed able to hold their own with the vigorous aggressiveness of the other subjects. There has been quite general lack of appreciation of the pedagogic courses by other departments, that has exercised anything but a benign influence on the teaching of university students.

Third, the teacher may get his knowledge of his special subject in the university or college, and his pedagogic training in the normal school. The normal school is a professional school, standing in this respect with the schools of medicine and law. We should expect that the best results would be obtained by giving the university training first, followed by the normal school work. In practice it is found that the reverse order works better. It makes a great difference in the teaching of a subject whether it is learned in the light of great educational principles, or whether it is viewed from a different standpoint. Students who are well grounded in the principles of teaching are able to see what is involved in particular methods, and are able to criticize intelligently the materials and methods offered in universities. On this account, I am reliably informed that normal school graduates are not always considered the most desirable students in universities.

It seems to me that the last is the most advantageous plan for securing better trained teachers for the high schools. In Wisconsin there is an arrangement by which normal school graduates may enter the state university in the junior year, thus being put at no disadvantage with students who go directly to the university from the high school. If this policy were made general, I think the matter of teachers for the high schools would be quite satisfactorily adjusted. Scarcely any other arrangements would be needed.

In all our discussion of this subject, we must understand that a large part of the teacher's preparation and the best part of it must be made while the teacher is engaged in teaching. The teacher who knows it all when he begins is hopeless from the start. He must be imbued with the spirit that thirsts for knowledge, and he must have right views of what constitutes education. Given these, there is hope for almost anyone, no matter from what school he has come, and without them, there is little prospect of anything but the most meager usefulness in the field of education.

Prof. F. E. Lloyd—I have only to say that I agree with the speaker in the main. There is however one point on which I wish to take issue. Prof. Harvey appears to be misinformed in regard to Teachers College, for we are, in that institution, trying to do the very thing he thinks we are not, namely, to prepare teachers in the best possible manner for high school teaching. And we believe that the results already attained justify the claim. We feel that Teachers College can meet the practical demands for the preparation of the high school teacher of the kind who can satisfy the ideals set forth by Prof. Harvey.

Prof. A. J. Grout—I have some personal knowledge of the matter, and wish to second what Prof. Lloyd says. I think he is fairly justified. I only wish however that all the teachers at Teachers College had Prof. Lloyd's judgment in selecting people who can teach.

With reference to the pedagogy of college professors, my experience from personal observation has been that a great amount of poor teaching is in the college. One professor said to me that it was so discouraging to call up man after man, and have him fail, that he preferred to keep on talking.

Prof. C. W. Hargitt—I would like to suggest that our friends can help normal schools in this direction by emphasizing one of the deficiencies of normal school teachers. In our state we have a good many normal schools, and most of them do not give anything like adequate preparation for the teaching of the sciences—one term in botany, one in physics and one in physiology. I have found that the pupils coming to the university from the normal school are not so well prepared in science as the average pupil coming from the high school. This is a mistake on the part of the normal school, and one which I think is in the power of those having control of the normal school to correct. There are normal teachers here who can confirm what I say. It is a mistake to give teachers the impression that with *one term* in chemistry, they can go out and teach chemistry scientifically.

Prof. Grant Karr—Prof. Karr speaks of high school graduates, and continues: Most of their work is textbook work, and that would give some reason for their lack of preparation. As for college graduates, I have had some of those to deal with in my work as superintendent of a normal practice school. I have had to deal with graduates of different colleges and universities. These young people come to us to get some knowledge of how to teach. Strange as it may seem, they do not get along any better with their practice work in the first few weeks than the average student who has done the regular normal school work. But such students are usually better in the long run.

Some of them seem to have such an abundance of knowledge, and are so deficient in ability to organize such a great flood of knowledge as to be seriously impeded in their work as teachers. One young lady, in particular, a college graduate whom I have in mind, was an entire failure at first, but after 15 weeks got hold of herself, and did much better work. Elementary methods and high school methods are the same essentially, though there may be phases in which they appear to differ very much. College graduates get hold of the practical work of teaching with little less effort than the person who has had less academic preparation. It seems to me that to get the highest development in the prospective teacher, it is necessary for the high school teacher to know something of the teacher's work in the grades. In that way he will come to understand method in its totality, as a principle. A preparation work that takes place in the grades, such as is provided in most normal schools, is a valuable foundation for high school teaching, and could be made use of with profit by high school teachers.

Section C. EARTH SCIENCE

REPORT OF THE COMMITTEE OF SEVEN

PRESENTED BY PROF. RICHARD E. DODGE, TEACHERS COLLEGE, NEW YORK

At the last annual meeting of the New York State Science Teachers Association, the following resolution was adopted:

> Moved, that the earth science section of the New York State Science Teachers Association request the president to appoint a committee of seven to consider the preparation of a series of exercises and suggest a course of study for public and high school laboratory and field work, and report at our next annual meeting.

In accordance with that resolution, the following committee was appointed by the president in the late spring and early summer: Richard E. Dodge, chairman, Teachers College, New York; Frank Carney, Ithaca High School; W. W. Clendennin, Wadleigh High School, New York; C. Stuart Gager, New York State Normal College, Albany; P. F. Piper, Central High School, Buffalo; Principal George H. Walden, Rochester; C. F. Wheelock, Head Inspector, Regents office, Albany.

Of this committee, Mr Piper has withdrawn because of illness, and two members have made no detailed suggestions. The report that is herewith submitted contains the opinions of four members only of the committee. Owing to the lateness in appointing the committee, no work could be taken up before Aug. 1. Aug. 8 a letter was sent to each member of the committee as it then existed, asking him to send to the chairman replies to the following questions, previous to Oct. 10, 1901.

1 Shall we organize a course based on the report of the committee of the National Educational Association or on the plan outlined in the *Academic Syllabus* of 1900?

2 Shall we plan a course that will call for a year's work in earth science and hence contain more of the geologic phase of physical geography than the course outlined in syllabus for 1900?

3 Shall we recommend that the course in geology be not included in syllabus for 1905?

4 Shall we plan a course for college entrance and indicate therein the special parts that should be omitted if the course is to be given in the first or second year of the high school, thereby fulfilling a double purpose?

5 Will you kindly take either the course suggested by the committee of the National Educational Association or the course of the syllabus for 1900 as a basis, and indicate what should be included in a course that will, to your mind, best fill the conditions recommended, and your answers to questions 1, 2, 3, 4 and send this to me to Teachers College, Columbia University not later than Oct. 10, 1901? Do not of course consider yourself limited to topics included in these reports; make as many additions or substitutions as you desire.

6 Will you please indicate in your course by check or by some simple means the points that you believe should be illustrated or amplified by laboratory or field exercises? This will give us a basis for organizing the exercises later.

Owing to the small amount of time available for committee work, the committee has decided to present merely a course of study this year. The chairman has had in mind not only the question of presenting a practical course of study in geography for high schools, but also a course of study which should improve on the present requirements of the Regents, and at the same time meet the requirements in physical geography as outlined by the College Entrance Examination Board of the Middle States and Maryland, requirements which are herewith presented as a basis of consideration.

Physical geography

The requirement in physical geography is based on the report of the committee on physical geography of the science department of the National Educational Association.

The following outline includes only the most essential facts and principles of physical geography, which must be studied in the classroom and laboratory. The material is for the most part common to the leading textbooks, though it should be recognized that no adequate laboratory manual is at present available. The order of presentation is not essential: it is recommended, however, that the topics be treated in general in the order given.

Outline

Recognizing that the field of physical geography in secondary schools should include (*a*) the earth as a globe, (*b*) the ocean, (*c*) the atmosphere, and (*d*) the land, the following outline is planned to cover these several large topics, with the further recommendation that the time allowance be proportionally increased in the order named.

EARTH AS A GLOBE

Shape of earth, how proved, consequences of shape
Size. How earth is measured; effects of size
Rotation: character of motion; latitude, longitude, and time
Revolution: rate, path and direction
Magnetism: compass, poles, variation
Map projection

OCEAN

- Form, divisions, and general characteristics of the ocean
- Depth, density, temperature of ocean waters
- Characteristics of ocean floor
- Distribution of life in oceans
- Movement of ocean waters
  - Waves—cause and effect
  - Currents—causes, proofs of causes, important currents, effect of currents
  - Tides—character of motion, cause of tides, variation of tides, bores
- Work of ocean
  - Classes of shore lines and importance of shore lines

ATMOSPHERE

- Composition and offices of atmosphere
- Instruments used in study of atmosphere
- Temperature
  - Source and variation of atmospheric temperatures
  - Isothermal charts of world, January and July, with special study of isotherms of northern and southern hemispheres, of location of heat equator, of cold pole, of crowded isotherms, etc.
- Pressure
  - Measurement of pressure
  - Use of pressure in altitude determinations

- Relation to temperature
- Study of isobars on United States weather map
- Distribution of pressure over world in January and July
- Relation of isobars to isotherms

Circulation of atmosphere
- Winds, classes, directions, causes, effects

Moisture
- Source, forms of, measurement of, precipitation

Storms
- Paths and characters of storms of eastern United States
- Daily weather at different seasons
- Relation of storms to general weather conditions
- Relation of weather to climate

LAND

General features of land as compared with ocean

Distribution of land

Map representation of topography

Changes in land forms, effects of elevation and depression

Plains
- Kinds of plains
- Characteristics of different kinds
- Development of plains
- Coastal plain of eastern United States in parts
- Alluvial plains, their formation and importance
- Relation of life conditions to different forms of plains

Plateaus
- Young plateaus
- Dissected plateaus
- Old plateaus
- Broken plateaus

Mountains
- Block mountains
- Folded mountains
- Domed mountains
- Massive mountains

Volcanos
- Distribution
- Character of at different stages

Rivers

- Life history of river—work of rivers, topography of valleys at different stages; lakes and lake basins
- Revived rivers
- Drowned valleys
- The great drainage basins of the United States

Glaciers

- Existing ice sheets
- Kinds of glaciers
- Work of glaciers
- Characteristics of glaciated area of northern United States

SUMMARY

Relation of man, plants, and animals, to climate, land forms, and oceanic areas

The outline given can but present the larger topics to be covered, and in a way suggest the point of view desired. Each topic should be treated so as to show its causal relations to other topics, and so far as possible the effects of earth features on life conditions should be emphasized.

The candidate's preparation should include: (1) The study of one of the leading secondary textbooks in physical geography, that a knowledge may be gained of the essential principles, and of well selected facts illustrating those principles. (2) Individual laboratory work comprising at least 40 exercises selected from a list not very different from the one given below. From one third to one half of the candidate's classroom work should be devoted to laboratory exercises. In the autumn and spring field trips should take the place of laboratory exercises.

List of possible exercises

Numbers in parenthesis indicate the value that should be given in estimating the total number of 40.

WORLD AS A GLOBE

Construct a diagram showing inclination of earth's axis, and effects of an axis at right angles, and parallel to plane of orbit (1)

Cause of day and night, and extent of sunlight over surface (1)

Construct a diagram showing position of earth, moon, sun, at the several phases of moon (1)

Construct a series of lines to one adopted scale, showing circumference and diameter of earth, and distance of several leading large cities from New York (1)

Determination of latitude, north and south line and high noon (1)

OCEAN

Study of ocean current maps (1)

Study of tide charts (1)

Study of types of shore lines (2)

Study of position of lighthouses, life-saving stations, and large cities in relation to southern Atlantic shore (1)

Study of map of world showing hights of land and depth of sea (1)

Explain selected steamer routes across Atlantic and Pacific (1)

ATMOSPHERE

Determination of altitude of hill by barometer (1)

Determination of dew point (1)

Comparison of January and July temperatures at 40° n. and s. lat. (2)

Location and migration of heat equator and cold pole (2)

Comparison of temperature over land and water at different seasons (2)

Study distribution of wind systems by seasons, and compare with pressure conditions (2)

Make isotherm and isobar maps from furnished data (2)

Find average wind directions about a storm center (1)

Making of complete weather maps from furnished data (2)

Study distribution of cloudiness and rainfall about a storm center (1)

Predict weather conditions from data furnished (1)

Find average rate and direction of motion of storm centers (1)

Study of condition of " cold waves " and " northeasters " (1)

LAND

Comparison of areas to scale (1)
Making cross-sections of contour maps to scale (4)
Cross-section of hachure map and changing hachure to contour map (2)
Writing description of models (4)
Writing description of pictures and accompanying map (2)
Construction of river profile (1)
Making drainage map of United States (1)
Written description of selected maps illustrating classes of land forms (4)
Planning a journey and describing country to be seen (1)
Locating illustrations of common land forms on some special contour map (1)
Four excursions in autumn, described in detail (8)
Four excursions in spring, described in detail (8)

At the time of the examination the candidate must present the original notebook in which he recorded with dates the steps and results of his laboratory exercises. This book, which should contain an index of subjects, must bear the indorsement of the teacher, certifying that the notes are a true record of the pupil's work. This notebook will be returned on request at any time within a year.

The committee has taken as its basis of work the recommendations of the subcommittee on physical geography of the committee on college entrance requirements of the National Educational Association. Three out of four of the members answering the questions proposed agree in recommending this report as a basis for our work; one member believes that the plan outlined in the *Academic Syllabus* for 1900 is superior in that it contains more than is proposed by the National Educational Association committee. The other members of the committee answering believe that the Regents report contains many unrelated and unnecessary facts, that it is less logical than it ought to be, and that we should plan a course " more prescriptive and yet giving freedom to the individual teacher." Three members of the committee believe that we should present a course of physical geography covering a year, and that geology should be dropped from the *Academic Syllabus* of 1905. This seems in line with the best thought in reference to secondary work as it now exists in the country. Three members of the committee believe that the colleges should accept for entrance a good course planned for the first or second year of high school work.

In accordance with these recommendations the following course of study has been worked out by the committee. This is a compromise course covering the accepted fields of physical geography, but there is a difference of opinion in the committee as to the order in which the larger topics should be considered. One member of the committee puts the ocean immediately after the earth as a globe; two members put the atmosphere in this position; and one recommends the ocean after the land.

It is understood, of course, that this plan as presented is merely an attempt to order the important related geographic topics pertinent to a secondary school course in a logical way, so as to produce under good teaching the best mental training on the part of the pupils. It is believed by the committee that mental training is more important than information as a result to be gained from geography work.

The course as outlined herewith should be presented in its larger topics, whether that presentation be in the first or last years of the high school course; but many details herewith included must be omitted if the course is carried on in the first year. Several members of the committee have recommended a special course on the physical divisions of the United States, or the physiography of New York state, as an elective in the advanced years of the high school, if the course presented here be given in the elementary years. The committee as a whole, however, makes no recommendations on this matter.

If the course outlined is adopted, and if the section desires to have recommendations later presented in reference to laboratory work, the committee should be continued.

Physical geography

Course of study for the high school

The earth as a globe

Topics marked * should not be included in a first year course.

- The shape of the earth
  - *Historical. Eudoxus
  - *Problem. If the north and south line of the surface of the earth were represented in profile by either of the following lines, how would the aspect of the sky be affected in each case by moving along the line? 1——; 2 ◡; 3 ∧; 4 ⌒.
  - *Aristotle. The earth a *small* globe
  - *Strabo (beginning of the Christian era), first gave the argument from the appearance of ships at sea
  - Simple proofs of shape of earth
  - Results from living on a globular gravitating earth
- The size of the earth
  - *Eratosthenes and the well at Assouan (Syene)
  - *The caliphs (11 cent. A.D.), Cassini in France (late 1600 or early 1700), Newton, Richer, French Academy (1675)
  - Effects of size of the earth on human life
- Motions
  - Rotation
    - How known
    - Character of the movement
    - Consequences of rotation—defining direction, determining relative position, measurement of time, day and night, flattening at poles
      - Life effects due to rotation. Application of shape and rotation to
- Latitude and longitude
  - Origin of the terms
  - Necessity for parallels and meridians
  - Longitude
    - *First determined by Strabo. How? Chronometer method and telegraph

    - Determination of a north and south line
  - Latitude
    - Determination of local latitude by the sun circle method, and by the altitude of the sun as determined by a north and south line
    - Use of latitude in navigation
    - Application of latitude and longitude to
- *Maps and map projections
  - Need of maps. Meaning of the term map
  - How maps are projected
    - Orthographic, conic, Mercator projections
- Revolution
  - Rate, path and direction of revolution
  - Construction by pupil, from given data, of the exact shape of the earth's orbit. Seasonal distribution of energy
- *The earth as a magnet
  - The compass
  - Determination of local magnetic meridian and angle of variation
  - Isogonal lines
  - How the life of man is affected by living on a magnetic earth

The atmosphere

- An invisible gas
- Composition
  - Gases. Dust. Relation of different components to plants and animals, including man. Relation of atmosphere as a whole to the life of man
- Introduction of summary of weather and climate elements, as illustrated by selected days
  - Directions for taking weather observations, and explanation of instruments used
  - Temperature
    - Source of atmospheric temperature. The nature of heat; how measured
    - Thermometers—centigrade, Fahrenheit, maximum, minimum

- Relation between angle at which rays strike and their intensity. Diurnal changes of temperature
- Distribution of heat—vertical, horizontal; need of graphic representation of temperature distribution. Isotherms. Study and explanation of isothermal maps of January and July and annual average of northern and southern hemispheres
- The heat equator. Its migration north and south, causing
- The change of seasons—explanation with individual apparatus
- Crowded isotherms and their explanation
- Relation of life to seasonal and diurnal temperatures

Atmospheric pressure

- Introductory—demonstration and measurement of pressure
  - Method employed—aneroid and mercurial barometers—barometric readings—*when taken—*reduction to sea level
  - Determination of altitude by means of barometric pressure
- Expression of pressures by isobaric lines. Seasonal isobaric conditions
- Relation of pressure to temperature

(In first year work no such detailed classification should be attempted. A description of the general system of winds and a study of the relation to temperature and pressure conditions is essential, however)

Winds. What is a wind? Direction of motion

- Methods of observation, measurement of velocity, classification according to velocity, etc.
- Winds consequent on a rotating planet (planetary)
  - Trades; prevailing westerlies; doldrums; horse latitudes; upper currents. Relation of wind belts to isobars and isotherms
  - Location and characteristics of each belt
- Winds consequent on a planet inclined 23½° on its axis (terrestrial)

    - Seasonal changes. Shifting of calm belts—consequent disturbance of path of winds—effect of earth rotation
    - Seasons and character of life in each area
  - Winds consequent on distribution of land and water (continental)
    - Continental winds
    - Monsoons
  - Winds consequent on diurnal conditions
    - Land and sea breezes
    - Mountain and valley breezes
- Humidity
  - Moisture as it exists in the air—*how measured
  - Origin of atmospheric moisture. Evaporation
  - Humidity—absolute, relative. Relation of temperature to absolute humidity
  - *Hygrometry. Condensation, dew point, saturation
  - Precipitation. Dew, fog, cloud, frost, hail, snow, and rain—how recorded in amount. Study of rainfall chart of the world
  - Relation of rainfall to interests of man
    - Agriculture (discuss value of irrigation)
    - Forestry
    - Manufactures
    - Commerce
- Storms of the westerly wind areas
  - Control of the weather by storms
  - Characteristics as to temperature, pressure, winds, cloudiness, rainfall
  - Path and rate of progress
  - Hot and cold waves, northers, blizzards, etc.
- Study of weather maps[1]
  - Local observation begun at the commencement of the work on the atmosphere. Weather predictions. Weather Bureau instruments, economic aspect

---

[1] This topic should be made brief in first year classes.

- Summary of weather and climate
  - Weather
    - Characteristic summer and winter weather of eastern United States
    - Study weather signals employed by United States government
  - Climate
    - Relation of weather to climate. Most important climatic elements
    - Climates of the different heat belts
      - Subdivisions according to varying character of different portions—land and water, coasts and interiors, mountain and plateau
      - *Dominant climatic features of these subdivisions
      - *Seasonal conditions; effect on life
    - General relation of climate to vegetation, animals, man

The ocean

- Distribution of land and water
  - To be studied from a globe. Land and water hemispheres—London as a center of land hemisphere
- Physical characteristics of ocean water
  - Density. *Causes of variation in density. *Color and phosphorescence. Temperature. Greatest variations—where found. *(Study of charts and diagrams, showing distribution of ocean temperatures, with causes and consequences of observed facts)
  - *Character of the bottom. Comparison with land conditions
    - Ooze—Globigerina (Foraminifera)
    - Absence of weathering on ocean floor, and its results
  - Depth—average—where greatest
    - *Divisions of oceanic areas
      - Great oceans; depth and volume compared with extent and elevation of land surface
      - Mediterraneans—relation of important ones to continental masses
      - Significance of temperature peculiarities

Submerged continental shelves—relation to continental masses

*Ocean life

Very varied. Shallow water and deep water life, and their comparison

Movements of ocean water

Easy—slight friction

Waves—Cause. Wave motion; *definition of wave parts—crest, trough, front, back, hight, length, velocity, period; limit of wave hight; use of oil at sea; effect on waves of shoaling; undertow, surf, breakers; how waves strike the shore; focusing at headlands

Currents—how known to exist; description, location, classification (warm, cold), deflection by continents and by rotation of the earth. Cause—*inadequacy of convection theory; comparison of charts of ocean currents. *Hypothesis that winds are the cause; *testing the hypothesis that winds are the cause. Important currents, oceanic eddies; economic importance of currents

Tides.[1] Description of tidal phenomena as observed along shore; comparison of tidal phenomena with phenomena of waves; comparison of tidal periods with lunar periods; explanation of tide-producing forces with diagram; testing hypothesis that tides are caused by the moon; spring and neap tides, bores, tidal races; economic aspect of the tides

The land

General features of the land compared with those of the ocean

The materials of the earth's crust

Mantle rock; bed rocks; the more common rocks and their general characters; stratification and its explanation

Weathering—origin of soils

Evidences and agencies of weathering

Results—formation of soil, widening of valleys

Strong rocks, or ridge and highland makers

---

[1] This topic should be treated briefly only in a first year course.

  - Weak rocks, or valley and lowland makers
  - Crystalline rocks, and their effects on topography
  - Stratified rocks, and their effects on topography, as determined by their relative strength
- The work of the wind
  - Blows dust and sand—beaches elevated, loess, sand dunes; erosive action—ledges attacked, faceted pebbles; importance—enriches soil by distributing it; wind action checked by vegetation and moist climate
- The work of water on the land
  - Fallen rain
    - Evaporates; sinks into the ground; runs over the surface, resulting in erosion; definition of a river, river system, basin, divide, watershed
    - The erosive work of a stream. Relation between transporting power and velocity
    - Results of erosion. Evidences that most rivers have carved their own valleys
    - Formation of tributaries by the gnawing headward of gulches
  - Young, mature, old, river valleys. Characteristics of each. Base level of erosion
    - *Migration of divides. Economic importance of this. Stream capture and beheaded rivers
    - Drainage systems of home locality, New York state, United States, world. Interior drainage basins
    - At first the topography guides the course of the streams, later the streams determine the topography
  - Impediments to the work of rivers
    - The work of a stream is impeded when its velocity is checked
      - At maturer portions due to base leveling
      - By the ocean and lakes
    - Results of impeding the velocity of streams
      - Deposit of sediment in the bed of the stream along the banks (flood plains), at the mouth—Study of cross-sec-

tions through flood plains. Economic importance, e. g. lower Mississippi jetties

Deposits at mouth of streams—Alluvial fans, deltas, continental shelf. Conditions of their formation. Results. Length of stream not constant

Effects of depression of rivers. Drowned valleys

LAKES

Relation of lakes to rivers. Distribution of lakes in United States. How made

Lakes in glaciated regions. Oxbows and cut-offs in alluvial plains

Lakes in arid regions. Bonneville, Lahontan

Lakes in volcanic regions

Lakes contrasted with waterfalls and rapids. Ultimate destiny of lakes

GLACIERS

Characteristics of glaciers
  Snow field, névé, ice stream
  Resemblance to rivers
  General characteristics and distribution of existing valley, piedmont, and continental glaciers
  Work of glaciers
    Erosion, scouring, and scratching; transportation and deposition—moraines, lateral, medial, ground, terminal. Other deposits—drumlins, eskers, kames, overwash plains, valley trains

Ancient glaciers—the ice age in America (North)
  Effect on topography and drainage
  *The Laurentian lakes and Niagara. *The "Finger lakes" of New York state

UNDERGROUND WATER

Springs—conditions of their formation
  Kinds, special mention of—artesian wells, hot springs, geysers
  Solvent power of underground water. Limestone caves
  *Reasoning from the phenomena of hot springs and geysers, what is the temperature condition of the interior of the

earth, leading to other evidences of internal heat as found in the study of

CLASSIFICATION OF LAND FORMS

Necessity of expressing land features by maps. Interpretation of maps

Maps showing
  Relief, shading, hachure, contour lines
  Comparison of contour maps with pictures of the same locality (or with direct observation, if of the home locality). Written descriptions of topography from map reading
  Drawing of cross-section profiles to scale from contour relief maps
  Field work in mapping and in cross-section drawing

Plains
  Of construction
    Coastal plains: characteristics, structure, origin. Early shore line and subsequent modifications. Drainage and dissection. Water supply. Fall line—how formed. Influence on human occupation and activities. Stages in development: youth, maturity, old age
      *The geographic cycle
    *Classification of coastal plains: narrow, broad. Examples of each. *(Ancient coastal plains: New York, Wisconsin, England)
      Geographic controls on coastal plains
    Effects of coastal plains. Examples

Effects of earth movements on position of rocks
  Dip, strike, folds, tilts, etc.

Mountains
  Essential idea of mountains. Brief suggestion of causes of mountain building
  Block. Young stage, e. g. northern California and Nevada.
    Characteristics; how formed, drainage, and dissection
    Earthquakes and their significance here. Effects on distribution of life

  - *Dissected block mountains, e. g. Utah
    - Characteristics. Effects of dissection; climate; control of human occupation and life
  - Folded mountains, e. g. Juras, Appalachians
    - Characteristics; topography. Drainage and its modifications
      - Stream capture
  - *Domed mountains, e. g. Black hills
    - Treated as block, dissected block, and folded mountains
- Plateaus
  - Young, e. g. Shiwits
    - Compared with plains of construction as to surface, structure, elevation, drainage. Effect on man
  - Dissected, e. g. Catskill, Alleghany, Cumberland
  - Old, e. g. New Mexico
  - Mesas, buttes. Ancient civilizations of North American aborigines
  - *Broken. Character, drainage, relation to man
- Volcanos
- Definition of volcano. Relation to the life of man and to the lower organisms. Features of young and old volcanos
  - Description, distribution, causes. Mapping of volcanic regions
- Earthquakes
  - Description. Regions of greatest frequency. How observed; causes; relation to man
- Plains of destruction
  - Characteristics, specially as seen in southern New England
  - Contrast with construction (young) plains
  - Terms—pene-plain, monadnocks
  - Relation of plains of destruction to other land forms
  - Effect of uplift. How old plains differ
  - Drainage—comparison with that of young plains
  - Culture relations; effect of change of base level
- Shore lines
  - Meaning of terms shore line and coast

On what does original outline of coast land depend?

Classification of shore lines

- Number of classes—how produced; characteristics
- Elevated shore lines
  - Characteristics
  - Changes effected by the ocean
    - Sand reefs—formation; advance and retreat; deltas and bays
    - Inlets—relation to coastwise traffic; tidal deltas
  - *Effects of depression and elevation on this class of shore lines
  - Effect on man; distribution
- Depressed or drowned shore lines
  - General characteristics; relation to man's life
  - Changes effected by the ocean
    - Formation of sea cliffs and benches; sea caves
    - Formation of bay head beaches and retreat of sea cliffs: *formation of barrier beaches and general retreat of shore line—*effect of strong tides
    - Land-tied islands—process; importance to man

Summary and conclusion[1]

The relation of all life, specially that of man, to geographic environment. Adaptation to changes in environment. Gradual mastery of environment by man with the advance of civilization. Importance of geographic control as shown by historical and commercial facts.

THE EARTH AND MAN

Summary and review

Civilization as related to environment

Environment exercises strong control over barbaric races. Examples

Civilized peoples

- Control of the past

---

[1] In a first year class it is recommended that the summary of the course be merely a review of the principal points in life geography that have been *touched on in the progress of the work.*

  - Control of the present—less marked. Ability to overcome existing conditions
  - Traveling across the continent today compared with difficulties encountered half a century ago
- Relation of surface features to man
  - Mountains—barriers due to trend, steep slopes, lack of water, rarity of air
    - Effect of barriers on the settlement of a country, e. g. influence of the Appalachian barrier on the settlement of the United States
      - Determined lines of settlement
      - Directed and limited immigration and migration
      - Strengthened early settlements
      - Offered protection from enemies
    - Dangers arising from a sharp line of demarcation between a people
      - Comparison of natural and political boundaries
      - Relation of pioneer settlements of Mississippi valley and Atlantic states
    - Effect of barriers on the development of a region
      - Growth checked through limitation of boundaries. Newburg and Fishkill compared
    - Effect of mountains on life of people
      - Characteristics of mountain dwellers—Scotch, Swiss, etc.
      - Differences in a people arising from separation of valleys, e. g. clans of Scotland
      - Slow development of isolated mountain dwellers. Mode of life of the natives of the mountains of Tennessee and Kentucky
      - Influence of mountains on industry
  - Valleys
    - Gateways for exploration
    - Regions of early settlement. Compare the settlement of the Mohawk and the Hudson valleys with that of adjacent mountains and plateaus

- Importance commercially, e. g. Hudson and Mohawk valleys a great factor in determining the supremacy of New York city
- Highways of travel

Plains

- Seat of early civilization, e. g. Chinese—developed in river plains of China. Hindus, in plain of Ganges
- People of great plains—tendency toward a nomadic life. American Indians, Arabs of the eastern deserts
- Influence on settlement. Uplands and lowlands of New England compared
- Influence on industry

Seashores

- Regular—lack of harbors unfavorable to development of great nations
- Irregular—favorable to growth of nations, e. g. Greece and Rome
  - Great nations of today
- Influence of seashores on industry

Relation of climate to man

- Effects of extreme heat, of extreme cold on man's mental and physical activity, e. g. dwarfs of the African forests, Eskimos of Greenland
- Effects of a temperate climate on man. Heat belts in which the great nations of the world are found
- Dry climate—importance of control directly on vegetal life, indirectly on animal life and man
- Industries of semiarid plains and plateaus
- Industries of well watered regions of gentle slopes
- Rainfall east and west of 100th meridian w. longitude noted—effect on industry
- Industries of regions of extreme cold—of tropical regions

Relation of economic products to man

- Effect on migrations. Discovery of gold in California, in Australia. Influence on industry

Influence of man on the earth
- Modification of environment. Land reclaimed from the sea—dikes built, streams diverted, hills leveled, marshes drained, deserts made fertile, etc.
- Distribution of plants and animals influenced
- Destruction and limitation of plant and animal life, e. g. buffalos, seals; forests—effect of destruction of forests
- Distribution of plants and animals extended

Bibliography

GENERAL REFERENCES

Annual reports, monographs and bulletins of the United States Geological Survey, Washington D. C.

Davis. Physical Geography. Ginn. Boston

Dodge. Reader in Physical Geography for Beginners. Longmans. New York

Dryer. Lessons in Physical Geography. American Book Co. New York

Journal of Geography. Lancaster Pa. (periodical)

Longmans' New School Atlas. Longmans. New York

Mill. International Geography. Appleton. New York

——— Realm of Nature. Scribner. New York

National Geographic Magazine. Washington D. C. (periodical)

Tarr. Elementary Physical Geography. Macmillan. New York

THE EARTH AS A GLOBE

Encyclopedia Britannica (latitude)

Herbertson. Outlines of Physiography. Arnold. London

Morrison. Maps, their Uses and Construction. Stanford. London

Todd. A New Astronomy. American Book Co. New York

THE ATMOSPHERE

Bartholomew. Physical Atlas, 3. Archibald, Constable. London

Davis. Elementary Meteorology. Ginn. Boston

——— Equipment of a Geographical Laboratory. Jour. Sch. Geog. May 1898. p. 170-81

Gannett. The United States. Stanford's Compendium series. Stanford. London.

Jameson, J. M. Elementary Meteorology. Jour. Sch. Geog. Jan. 1898. p. 2-9; Feb. 1898. p. 56-62; Mar. 1898. p. 96-104; Ap. 1898. p. 139-46

Monthly Weather Review. Weather Bureau, Washington D. C. (periodical)

Waldo. Modern Meteorology. Scribner. New York

Ward. Climatic Notes made during a Voyage around South America. Jour. Sch. Geog. Sep. 1898. p. 241-48; Oct. 1898. p. 297-311

——— Equipment of a Meteorological Laboratory. Jour. Sch. Geog. Sep. 1899. p. 241-49

——— Practical Exercises in Elementary Meteorology. Ginn. Boston

THE OCEAN

Darwin, G. H. The Tides. Houghton. Boston

Davis, W. M. Winds and Ocean Currents. Jour. Sch. Geog. Jan. 1898. p. 16-20

——— Waves and Tides. Jour. Sch. Geog. Ap. 1898. p. 122-32.

THE LAND

Brigham. Textbook of Geology. Appleton. New York

Davis, King & Collie. The Use of Governmental Maps in Schools. Holt. New York

Geikie. Scenery of Scotland. Macmillan. New York

Gilbert. Lake Bonneville. Monograph 1, United States Geological Survey.

Marr. The Scientific Study of Scenery. Methuen. London

Mill. New Lands. Lippincott. Philadelphia

National Geographic Monographs. American Book Co. New York.

Russell. Glaciers of North America. Ginn. Boston

——— Lakes of North America. Ginn. Boston

——— Rivers of North America. Putnam. New York

Shaler. Aspects of the Earth. Scribner. New York

——— Sea and Land. Scribner. New York

Wright. Ice Age in North America. Appleton. New York

SUMMARY

Guyot. Earth and Man. Scribner. New York

Redway. New Basis of Geography. Macmillan. New York

Shaler. Nature and Man in America. Scribner. New York.

Small & Vincent. Introduction to the Study of Society. American Book Co. New York

Trotter. Lessons in the New Geography. Heath. Boston

[The discussion was led by Head Inspector C. F. Wheelock, of the Regents office, who emphasized the necessity of having a course sufficiently elastic to allow the local environment to be used by any teacher, and further one that would allow each teacher to make special use of the facts and methods most familiar to him.]

Miss Elizabeth E. Meserve—I hesitate to criticize the combined mental work of seven men. Nevertheless, I shall speak from the standpoint of a teacher in the secondary schools and teacher of physical geography. For whatever these men may decide on as a suitable collection of facts for a course, the work of teaching this will probably fall to a woman.

First, in regard to the suggestion that physical geography be made a full year's course. If this course is to come in the first or second year of the high school, I say *no.* I object to teaching physical geography in the first year as the course *now* stands. I believe that much of the so called physical geography can be taught in the grammar schools in connection with the course in geography, reserving the more difficult part not for the high school, but for college. The pupil comes up to the subject of physical geography, as the course is now planned, with no science to help him, and he has what should be a review of many of the sciences before he has had the subjects themselves. I am not in favor of offering physical geography as a college entrance subject. The pupil, in my mind, will receive more mental training from some definite branch of science. When we teach physical geography in the first year, we are hampered in the very beginning of our work. In order to understand the motions of the earth and their relations to the physical conditions on the earth, the atmosphere and the movement of the ocean waters, some knowledge of the principles of physics is needed. To understand the earth's crust, its structure and the resulting forms, the pupil needs some knowledge of geology. So much of our time is spent and must be spent in teaching some of these principles that we almost forget just what we are supposed to be teaching. And it leaves so little time for the relations which exist between the earth and the life on the earth, that these things come in, in many cases, like the moral to a story.

Our work is too fragmentary; we touch on too many things. In botany, zoology, physics, or chemistry, we bring the pupil to some place where he has the feeling of something definitely accomplished.

The course as submitted by the committee of seven differs from the Regents course in leaving out some of the unrelated matter, or very distantly related matter. This also enters more into details, too much so, perhaps, in the subject of the land.

As to the order of subjects, it seems to me a minor matter, as teachers must adapt that to the time of year in which the subject is taken up. Under the subject, " the earth as a globe," as outlined in this course, I believe we should omit the historical references, referring to them in a very general way, but making no definite study of them. The pupil in the first year has but little knowledge of history, and names of famous astronomers and physicists mean nothing to him; neither do dates appeal to him as interesting topics. Then, too, for the best understanding of these problems, more knowledge of mathematics is necessary.

I believe we should emphasize rather more the importance of the subject of latitude and longitude, the location of places, the differences in time, and the uses of latitude and longitude in navigation and surveying.

The facts in regard to maps I should leave till later, unless I forget it altogether. Logically, of course, it comes in at this place in the outline. But practically it will be much better understood much later in the subject. After the pupil has done some field work, and made careful plottings in his notebook of local places, indicating position of lakes, forest regions, hills or mountains, and traced the course of one or more rivers (for a part of its journey); after he has done all this, the use of maps will be quite clear to him, and relief, shading, hachure and contour lines will stand for something more than vague terms. I am not sure that it matters whether he ever knows just how the Mercator or orthographic projections are made. He will know the practical value of a map, and can interpret it intelligently.

We are inclined, in plans for physical geography, to place too much stress on the subject, "the earth a magnet." We expect the pupil to understand all about magnets, and to apply that knowledge hastily gained, to the consideration of the earth as a huge natural magnet. We expect him to talk intelligently about the magnetic needle, its variations and its use in the compass. At this point the Regents call for a certain ability to name "electrical phenomena." I am glad that this is omitted in the outline. The word phenomena carries a great deal of fear with it any way, and, when you prefix to that "electrical," with all the strange misunderstood and non-understood qualities of electricity, the pupil is overwhelmed with the awfulness of the things he has to remember, and he associates, instead of our beautiful aurora borealis, electrocution as an electrical phenomenon.

Under the topic, "physics of the atmosphere", comes a great difficulty. We forget that we have made the jump from magnetism to heat and pressure. The principle of the thermometer and barometer must be mastered. The isotherms and isobars must be fully understood. Very little can be done with the subject, "light", as the average pupil can not understand, at this stage of his mental development, the principles of refraction and reflection. Winds, humidity, storms and the weather charts, supplemented by actual observations on the part of the pupil, require a large proportion of time.

Under climate, considerable time must be spent on causes. It is quite necessary that the pupil be able, not only to state the width of the different zones, but to tell why they are of such width.

If we ask pupils to tell about "the midnight sun", we receive strange information. Is that to be wondered at when grown people remain confused? A man, in giving a stereopticon lecture to children of the grammar grade, made this statement. He had shown a picture of "the land of the midnight sun"; "And now, children", he said, "the peculiar thing is this: the sun does not rise in the east and set in the west, but it comes up anywhere and goes down anywhere."

At first I thought that the outline was altogether too long on "the ocean"; but I soon discovered that at least one third of the outline is what we usually class under the topic, "the land". This leaves the description of the ocean bed, something of the temperature of the ocean waters, and the life in these waters, as minor subjects, to be treated briefly. Some time should be spent on the subject of currents, but *tides* the pupil can hardly comprehend.

Of course the main work in physical geography is that which comes under the topic, "the land". This we want to make as complete as possible, and yet keep out as many technical terms as we can. I hope a course in physical geography may be prepared which will combine the simplest facts—perhaps better, the most closely related facts of the earth, its influence on plants and animals, and man's relation to the physical conditions of the earth, and his part in the distribution and destruction of animal and plant life.

[The third speaker was Prof. Albert P. Brigham, of Colgate University, who spoke from the standpoint of the college. Prof. Brigham proposed some minor changes in the text, and spoke in reference to the preferred order of the larger topics. He emphasized further the necessity of having one year's continued work in physical geography, if the work is to give training proportionate in value to that given in the more exact sciences.

Under the five minute rule the report was further discussed by W. W. Clendennin, of the Wadleigh High School, New York, by Frank Carney, of the Ithaca High School, and by Prin. George H. Walden, Rochester.

At the conclusion of the discussion the section voted to ask the association to continue the committee of seven one year, to draw up a series of laboratory exercises in physical geography, to accompany the report of this year, and to outline a course in geography for elementary schools.]

Section D. NATURE STUDY

Prof. C. R. Drum—I feel a little out of place opening the subject this morning. I know very little about nature study. I have tried to do a little work along that line in the vacation schools of Syracuse. We had five last year. On the average we took four or five hundred pupils into the country every week. I always accompanied the teachers on the trips.

I ought to speak just a word about the class of pupils. They are pupils from the congested districts, the crowded districts, from what we might call the lower strata of society largely. Of course not all; they are newspaper boys, etc. Last year we did nature work for boys, this year, for both. I intended to prepare a definite, concise paper, but my little boy was sick and I was unable to do it; so I shall have to give you four or five little illustrations from our work.` First, I want to speak of the garden at Fraser school. As soon as the Board of Education decided to have a summer school at Fraser, the teacher who was appointed to have charge of that school immediately began to put in a little garden over there. The children were interested in the garden. People said it was no use, " because, if you do, the bad boys in the neighborhood will destroy it." It is a fact that the garden never was touched. One of the most troublesome boys in the school went one time and planted a little vine in that garden when there wasn't anyone around. And do you know those fellows protected that garden? No one would think of going into that garden. I assert that there is a certain amount of moral training there that ought to be duplicated everywhere.

In another school a boy brought down a big, green caterpillar. He brought it down to have me see it. I did not get down to that school that day. He had it in a box. He kept it over night. In the morning, the next day, when I arrived, he brought out his box to show me the green caterpillar; and during the night that green caterpillar had begun to weave his cocoon, and had it partly woven. It was thin all over the body, and a more surprised boy you never saw in your life than that little fellow. I imagine that boy will pick up all the green caterpillars he can find forever after. I think he has the cocoon. That boy will some day be a scientist, I judge, because of his interest, and will create an interest for those things in the other boys with whom he comes in contact. That boy will be a scientific investigator. There is no question about it. He is so interested in it. He might have read that in the book, but it would not have had the same interest as to get the knowledge firsthand.

There is another illustration which I wanted to bring up. A group of boys from the summer schools begun last summer, were looking intently at an object on the ground. They were apparently very much interested in something. A teacher in a school, passing, saw them. She approached the crowd and inquired of one of the boys, "What are you looking at?" He says, "Looking at a toad down there." He said that Mr Smith told them the story of the toad, all about the toad, many interesting things about it, and told them the next time they saw one to watch it. Now, good seed always bears fruit. The teacher who told the story of the toad little thought of the interest he had created in one of God's most humble creatures. Ordinarily those boys would have kicked the toad off the sidewalk or hit it. That is moral, ethical training, and those boys are becoming investigators, and some day some one may be a scientist. They are getting the spirit of investigation in this nature study work.

We took trips to the Valley, up into the Glen, and on one of the trips I went up into the Glen ahead of the boys. They were interested in the appletrees which no one in particular owned, and they would climb the trees and help themselves to the apples; and I stepped up into the Glen. I saw a chipmunk on the sidehill, and I sped back as quietly as I could and told the boys I wanted them to see and come quietly. You have read Cooper's description of the Indians when they were after anything, how they would go. I imagine those boys got up into the Glen something like that. A large number of them had never seen a chipmunk, and the interest, pleasure and profit they got from watching that little fellow seemed to me wonderful. I felt that not a boy there would ever take an air gun and shoot a chipmunk. I used to when I was a boy; liked to shoot red squirrels and chipmunks, etc. No one taught me any better.

Those lessons give to the children a desire to love all of God's creatures; and you must appreciate the fact that these boys are the boys of our streets. A little farther up the Glen a group of girls were watching something on the rock, and, when I arrived there, they were interested in a snail. I believe in our trips; on the trips we collected a great deal of material. We did not have anything but what we would use in the next week's work. Each school had a trip one day in the week. They were watching that snail and were much interested in everything they could see. I never had so many questions asked me before in the world, and so many I could not answer. I had to say we would endeavor to find out. The interest in nature of those little fellows was marvelous. The chance of a snail with the house on his back, crawling along, to teach a lesson of God's care of His creatures!

Nature study not only teaches children to observe and investigate, but it turns their minds to the moral side, and also to the ethical and to the religious, if I may say so. It seems to me it is one of the most fundamental subjects we have to deal with.

After the vacation schools closed, I went down to Otisco lake fishing. I was seated in the boat fishing, and hooked on a crab. It would squirm a good deal; I threw it into the water over there, and by and by got hold of a bass. Do you know that during the first part of the trip I enjoyed that immensely, but somewhere from my subconscious self there loomed up something, an impression, and I said, "My pleasure is the suffering of that poor bass over there." I was fishing for fun, not because I wanted something to eat. The impression came to me that that was wicked. Where did I get it? From my nature study trips with the boys. In trying to help them, something seemed to react on me. I declare, I went down for a two days' fishing trip: I stopped fishing and went in, and went home. Perhaps it was foolish and perhaps wrong, but I felt that way. I have not been fishing since. I may go again sometime; but that is the way I felt that day. Men will go up into the woods and shoot the deer. Boys brought up to nature study won't do it. To get a fine photograph of one is better than to do that.

We took from 50 to 150 children on the trolley. Usually had three or four teachers. They were very well behaved. This summer they paid their own fares. Last year I paid all the fares. Perhaps it is just as well to have them pay the fares. Oh! how they enjoy it! It gives them such a fund of material. If they went out without direction, nothing would be applied, but direction of attention is necessary. We had no particular object in view except to get out. We simply, if we ran across anything like the snail or chipmunk, observed it; or, if we found something to bring home, we brought it. We played games after we had the little trip, half or three quarters of an hour.

Cornell University sent some excellent help down year before last. They gave me most of my ideas on nature study work. Mrs Comstock, Miss McCloskey and others.

I had been over the ground a good many times. The teachers had to answer the questions, "What's this?" "What does it mean?" "What is it good for?" "What does that do to you?" I never felt my ignorance so much in all the world as I felt on the trips. I was perfectly frank. I did not assume to know what I did not know.

The boys who went the first year became leaders the second year, and they know a whole lot of things. I have in mind one boy in particular who developed quite an interest from the previous year. He was delighted, too, to be one of the leaders. He had a little crowd, and could tell them many things, which was due to the fact that they get a little material each time, and that was added to.

I had no previous training. A little zoology out of a textbook at normal school; and I had studied geology some—that is all. The only thing is to begin, and you learn a lot. I have learned quite a little. I have been obliged to. A child brought a beautiful moth over to my house. I have been looking it up and finding out its history. There is a great deal of enjoyment and satisfaction in it.

John W. Spencer—Yesterday afternoon the discussion ran on the minimum amount of scientific knowledge a teacher should have in order to have a license to teach nature. This morning we are trying to bring up evidence that a person without any knowledge and with a love of nature can teach something. The main thing is to have a handle on what little we do know, so we can bring it out. As I said, Mrs Miller anticipated that point. I was going to ask about it.

Prof. Drum—I intend to be able to pass the examination later.

John W. Spencer—Then, Prof. Drum, you believe that one of the important features is to inspire the children as to new reasons?

Prof. Drum—Yes. If you can start them off and keep them moving they will get enough to keep them going all their lives. I gave those illustrations with the thought that those boys will continue in that line.

John W. Spencer—In your boys you have excited wonder and interest; and, whatever they saw, they felt as if it had meaning and wanted to know the meaning? That is your method?

Prof. Drum—Yes.

Mrs Miller—Miss Whittaker, of Brookton, has had some experience with carrying on clubs of nature study; clubs for children. I have asked her to tell us something about the club, how it began, how it continued, and what she feels has come of it.

Miss Elizabeth Whittaker—To begin with, I feel that I have not done any nature study work. I never heard of nature study till November 1900, when I received a circular letter from the university and the directions for the organization of clubs. I had been fond of the study of nature; and, when I began teaching in September, I went out with the children two or three times each week into the country. Nearly all geography work was done through these excursions or walks. The leaflets were a valuable aid; and, in case I became puzzled, I would write to Mr Spencer to find what next to investigate to understand clearly the matter in hand, or what book would give the desired information. The idea came that perhaps I could make a club serve to discipline the room, a sort of self-government scheme. I asked the children one night to stay after half-past 3 and talk about organizing a club for the study of common things and the taking of regular walks. I told them I thought it would be a good idea to start with few people. I decided to take 12, a certain number from each grade, chosen from those having the highest standings. The best work counted most. I told them that each morning for 10 minutes we would talk about interesting common things. They might bring anything to school they liked. Any one might speak. All had the full privilege just as much as the members. I used the 10 minute talks to prevent tardiness. There were 73 cases the year before, which I did not like. I told them that the club members could write to Mr Spencer once a month; those not club members could not have the privilege. Club members could vote. Voting was to them, a wonderful thing. I read the names of the pupils who were to be the charter members; and told them for a while we would hold an election once a week, and, if their work was good enough, others could come into the club. Out of the 12, six were chosen to frame the constitution. The constitution adopted required that every child's standing should be 90% to remain in the club. They required more than I expected. If any member of the club was not almost perfect in deportment, by a two thirds vote of the school, not of the club, he should be dropped till he recovered. If the work was below 90, he was not required to do any club work, so that he might have an opportunity to catch up in his studies.

The plan succeeded, I think, because last year, after the club was organized, I had six cases of tardiness against 73 the year before. This year, two cases. One child came without his shirt waist because he was not going to miss the talk. His mother came 10 minutes later, very much disgusted. She had the shirt waist. As for discipline, we suspended two pupils during the year. One was dropped for fighting on the way home from school. He is back in the club this year. Out of 38 children the week before last, we had 28 members. The other 10 scholars are striving hard. Some have 88 and are trying hard for 90. The language work has improved. They write the letters at home. Those who are not members write more than those who are. I showed the members' letters to two ladies, and they read 17 letters before they stopped. They enjoyed them. Every one by eight year old children.

In September we began studying seeds. Then we studied grasses and then began to study the soil in which these things grow. We live in the suburbs, and could look at the soil. We made window boxes and planted these various seeds and watched them grow. We next studied the nature of the soils in the country where the fruits we have grow. In fact, we have done all our fourth grade geography work since September, and are getting the fifth year work well in hand. They work all the time that way. We don't seem to do any nature study proper. It just seems to go in with the school work.

We have five caterpillars; we had one to begin with. They live in a cricket cage. One boy is very fond of them. The children used to take turns in carrying them around in their hands. One boy would occasionally manage to keep one in his pocket. One day we had a caller. The smallest caterpillar used to take excursions for about an hour and go back to its cage. This lady stepped on it. We thought it was dead, but after a little while the caterpillar was crawling around. The next day the lady sent down four caterpillars to make up for the one. Out of school hours, the five are usually crawling around on some boy's hand, while some one is playing a mouth organ to see if they can hear. Occasionally a caterpillar will rear its head, and they insist it can hear.

I did not know that I was undertaking nature study work when I began. I was always out of doors with my father on the farm. I would often sit half a day in an appletree and watch a bird build a nest. In high school I had physics, which helped me a great deal. Physiology did not help much, so far as I know. Physical geography helped me about climate and atmosphere, while much reading helped a great deal. I told the children I knew nothing about nature study and took the attitude of a learner with them. That is why they have worked so faithfully with me.

Mine is practically a rural school. We have about 80 children in the school. I have 38. There is no work of this kind done in the higher grades.

About the kinds of soil—we found the kind in which the grass grew. As there is a hotel in the place, I spoke to the keeper for her tin cans. The boys made window shelves. We had good success with the seeds. One father came to me and wanted to know something about rotation in crops. He asked me what to plant next year after potatoes.

Mrs Mary Rogers Miller—Miss Hill, of Syracuse, has had problems which have been somewhat different from Miss Whittaker's and Mr Drum's. She will tell us how she managed them.

Miss Mary E. Hill—I am a teacher in a private school, and I have the charge of nature study work and also teach two sciences. Having only 10 minutes, I wrote out some of the preliminary things I wish to say; and, then, I have some of the children's work which I thought would illustrate a little my matter.

Nature study was introduced into this school about four years ago, and was soon after made a permanent part of the work. I found to my surprise that the oldest class had some decided opinions which had to be overcome. Previous to this time I had not taught young children. I had taught science work to older children in other schools, so that practically the nature study itself was a little new, as nature study is not taught exactly as the sciences are, though the method is fundamentally the same in all nature study.

Of course, as everywhere, the children are given the living specimens, and learn to make their own observations. We use drawing, because I think it is exceedingly valuable in making them see exactly and find out what they have not seen just right. The trips and field excursions are an important part of the work, and I have as many as possible, though fewer than I wish. At first it was hard to get the children together because they had many outside interests. Boys' athletic clubs interfered a great deal, and one of the highest tributes to the work was given by a small boy on one of these trips. He looked up with a glowing face and said: "*This* is as good as baseball." Another boy said he would rather have a week in the country than a month in the city. One of the things which is encouraging to me is that they do things at home without being told to do them. I found that suggestions to do things at home did not always bring good results; so I ceased to give them, because I found that, if they were interested, they would do things without being told, and, if they were not interested, they forgot. Sometimes they bring things to the class, which I use. I always use these specimens because I wish to encourage the children to bring them, but never depend on the children to bring material at all. One child saw two woodpeckers fighting in the spring. Though I don't like to use dead material, I did use those to show the interesting features of woodpeckers. Another child brought a live bat. That was an interesting study. It was a good subject for study. One thing I remember they said. When a bat was disturbed, it gave out "a nice perfumy smell." It is true. I never knew that; and some people might not consider it as pleasant as the children did. He climbed about on the netting and, when let out purposely, he flew about and fell on the floor. They found he could not stand on account of the way his legs were attached to the wings.

I find also that in the summer, after their vacations, they have a great deal to tell me when they come back. Most of them are fortunate enough to spend their summer vacations in the country. They sometimes repeat work at home that is being done in the school.

I have this fall a new room for the work, which is very large and light, having seven large windows which look out on the yard, in which a number of trees are growing, some young and some old. I have a better opportunity than before to study the trees, and have been giving the children some lessons on the study of trees for several seasons, for the sake of teaching them in a general way the characteristics of the trees; that trees are not at all alike; that they have characteristic growth; and are a little different when young from what they are when old. Across the street, beyond the fence are old elms, and in the yard, young elms. They see relation between old and young, and with a little suggestion have learned why there are no lower branches on the elm trees. I found perhaps more strikingly illustrated than ever before, the fact that drawing does make them see better, because some wanted to make the tree fork too high or too low or spread apart too much after it had divided, and they made certain other mistakes. I tried two ways of making them draw; one by measuring and the other by judging roughly, which answers better than measuring exactly. At least I got better results with these young children.

I have evidence that certain results are being obtained; certainly that love of nature has been awakened, and observation quickened; they are seeing that things do not happen, and that things are not always what they seem at first sight; that nobody knows everything about anything; and they may find out more. Humane consideration for the lower forms of life is being strengthened. Instead of being afraid of spiders and caterpillars and other things which have been thought ugly, they find them interesting objects for study. I find, too, that it is of value when children come to the study of the high school sciences. They know better what is meant and do better work. I also find that the children who come into the higher grades of the intermediate department who have not had this work are very much at a disadvantage with the other children. There is no spirit in the class against the work, as there was. It may be partly due to my experience with younger children, but that is the fact.

We have been studying the cocoons of the spider this fall. I have not had time to mount the work in a way to let it be seen. We found them in great abundance on the sweet clover, and they looked a little like some cocoons we had before, except in shape. We opened them and found the egg masses within. In some were the young spiders, motionless, but, on stirring them, they moved about. We also found some of the empty eggshells, looking like white powder inside. Immediately after having seen some of the egg masses, the children concluded that they were the "skins" of the egg. Some thought at first that the hole in the top of the cocoon was for the young spiders to get out and come in. Another suggested it might be to give the spiders air, which was probably the case. This study is not yet finished, because we want to see what will happen by spring. Those deprived of their covering are not dead. I will show a few specimens of the work.

[Miss Hill exhibited specimens of the drawings made by the children and compositions written by them. The remainder of her talk was explanatory of the illustrations.]

Miss Bessie Dewitt Mershon—It is unfortunate that at this point the program must be changed from the informality of the last half hour to a written paper; but, fortunately or unfortunately as one chooses to think, I was brought up a "blue presbyterian" and so find it very difficult to collect my thoughts when before an audience of this kind.

My training for this nature work has been little so far as schools are concerned. During my school course I had one term's work in botany—just enough to let me peep into that great Book of Nature and make me want to know more. So ever since, I have been at work with botany, zoology and geology. My teacher for the greater part of the time has been Mother Nature; my lessons were the fields and meadows with the Book of Nature; my helps have been any book or paper I could find on the subject in hand; but none were so true as that great world-wide book.

My nature work teaching began in Springfield Mass., where the work was planned by our able supervisor, Miss Stebbins. I was fortunate enough to be able to go out a few times into the fields with Miss Stebbins, where she made me feel with Stevenson:

> The world is so full of a number of things,
> I'm sure we should all be as happy as kings.

Since coming to New York state, I have been studying under the direction of the home nature study bureau of Cornell; and, if I were able, I would beg, urge, yes and implore every teacher in the state to follow the same course, and I only wish it were possible for every one in this country to do so. It is well worth all the time and trouble, which to me meant nothing but writing down the answers, for the observations were carried on in the fields with the children, where children and teacher were alike learners.

As to the bringing of the work into the school, I can not speak strongly enough in its favor. But in order to make the work successful, as in everything else, it is necessary that the teacher enter into it with her whole heart, for, as an author has said, "The difference between half a heart and a whole heart makes just the difference between signal defeat and splendid victory."

Another great aid to my work has been that of having a junior naturalist club in my room. Oh, you teachers who have not tried to have such a club do not know what riches you are missing! No work is added to that of the teacher, but rather she receives much help, as the children like the idea of being members of a club; and then the leaflets which come each month to each child as well as the letters from "Uncle John" are looked forward to the whole month and are very helpful. My experience has been that the children's eyes are opened to the many beauties of nature which they had been passing almost daily unnoticed. Mrs Browning has written:

> Earth's crammed with heaven,
> And every common bush afire with God;
> But only he who *sees* takes off his shoes:
> The rest sit around it, and pluck blackberries.

If we teachers can lead the children to *see* one hundredth part of the beauties of nature, we may be happy. If we can only feel what Dr Payson said long ago to some teachers!

> What if God should place in your hand a diamond and tell you to inscribe on it a sentence which should be read at the last day, and shown there as an index of your own thoughts and feelings, what care, what caution would you exercise in the selection! Now this is what God has done. He has placed before you the immortal minds of your children, more imperishable than the diamond, on which you are to inscribe every day and hour, by your instructions, by your spirit, or by your example, something which will remain and be exhibited for or against you at the judgment.

If this be true—and I believe every word of it—what better *can we do than* lead these children intrusted to our care, to see the beauties of nature, and to observe some of its laws? Where can the idea of water partings, river basins and systems and the divisions of land and water be more easily taught than on some sloping ground during one of our thaws? We have had very enjoyable times when the pupils, after working with the sand table in the schoolroom, have gone out to a gentle slope near the school and with long sticks pointed out the various things. I have never found children getting cape and peninsula or isthmus and strait confused after a lesson of this kind. And oh, how they do enjoy the lesson!

At one time we had a glass fruit jar brought into the schoolroom. It was partly filled with soil from an ant hill with a number of ants. A thick brown paper was wrapped around the jar to keep it dark, and it was left for several days with a lump of loaf sugar on top of the ground. When we took off the paper, we found that work had been going on all the while. Two large halls were found close to the glass, leading from opposite sides of a room which was evidently the nursery, for in it were two pupa cases.

After this experience I found that the children no longer desired to kill the ants which they saw running over the walks. In fact, one active boy told me he had spent nearly two hours one Saturday morning watching some ants at work at one of their hills. I knew from what he told me that he had been thoroughly in earnest.

One morning last spring one of my boys came running up to our room, followed by about a dozen others. Everyone was looking troubled, and my boy was bareheaded. As soon as they reached the room, Charles asked very earnestly, "Can't I go back to Plant street and put this bird back in its nest?" I looked and saw that he had put the bird in his cap, so as to have it as comfortable as possible. I also saw that the bird was nearly dead, so asked him if he did not think he could put it into one of the trees near the school just as well. He looked up to me with an expression one could not possibly refuse and said, "But its mother is crying up there on Plant street." When he returned after putting the little one in its nest, his face showed that he felt,

If I can stop one heart from breaking,
I shall not live in vain:
If I can ease one life the aching
Or cool one pain,
Or help one fainting robin
Unto its nest again,
I shall not live in vain.

Dr Johnson said, " To cultivate kindness is a valuable part of the business of life." Another author has well said—what I think our nature work is doing:

> Man has one power in particular, which is not sufficiently dwelt on, it is the power of making the world happy or at least of so greatly diminishing the amount of unhappiness in it as to make quite a different world from that which it is at present. The power is called kindness. The worst kinds of unhappiness, as well as the greatest amount of it, come from our conduct to each other. If our conduct were under the control of kindness, it would be nearly the opposite of what it is, and so the state of the world would be almost reversed. We are for the most part unhappy because the world is an unkind world. But the world is only unkind for the lack of kindness in us units who compose it.

Hence we may conclude that " the child who is kind to animals will never forget his obligations to his fellow men."

Early last June we had a very happy surprise on opening an express package from " Uncle John " to find it contained a number of silkworms. We placed them in a terrarium made of wire netting, and two boys were delegated to go for the mulberry leaves each day. In a few days one of the caterpillars stopped eating, and in the morning we found a beautiful cocoon. The children were greatly excited as to what should be done with the silk. I heard them discussing it together before school, and finally one of them came to me and asked what I was going to do with the silk. I said that I had not yet decided, and then asked him what he would like to do with it. He said, " Oh, we all want you to have a silk waist out of it." I did not wish to throw cold water on such generosity, so I thanked them and said, "We will see about it." In a few days, after we had had some lessons on the silk cocoon, we unwound a part of one of them and then raveled out a very small piece of ribbon, and the children saw for themselves what I did not want to tell them, that to make a waist we should need many, many more cocoons than we had.

Our field lessons form one of the most enjoyable features of our work. When teacher and 48 pupils turn their backs on school and books and city streets to go forth into some wide field or woods, only those who have tried it know the feeling of freedom which comes over every one of the number.

One class which I had been teaching in the heart of a city, when first taken out into the fields, was very expressive of this feeling. As the first boy entered the field, he turned a somersault. He just had to, and quicker than it takes me to tell it every boy followed suit; some of them two or three times. I wondered, as I stood there watching and enjoying the performance, what an onlooker would think of my class and my control of it, but, thinking I knew my boys, I did not worry. As soon as they had thrown off the crowded city feeling, every boy stood with head up and feet down ready to look for the things we had gone to seek. That day we were to look for leaf-miners and galls, and we found that

> There's never a leaf nor stem
> Too lowly for these tiny creatures.

Another field lesson was to see how many different ways plants have of scattering seeds, and it was surprising to see the number of ways found, and oh! the shout of joy that went up when we came under a chestnut tree, the first frost of the season having come the night before. I was reminded of the little poem about the chestnuts, so the next morning had it written on the blackboard for the benefit of the children.

> The chestnuts closed their purses tight,
> But Jack Frost opened them all last night.
> I think some time I'll sit up and see
> When he opens the burs, if he won't show me,
> For I've wondered so, and I wish I knew
> Why he don't get pricked, as my fingers do,
> And I can't see why, after all his fuss,
> *He leaves them* here on the ground for us.

We have had toads, fishes, frogs, crickets, grasshoppers, caterpillars, etc. in our room, and I find that having them there is an aid in discipline. At one time I had a boy with an exceedingly quick temper; he would strike and say the most unkind things on the least provocation. One day he asked me if he might care for the fish. I said, "John, if you could keep your temper I would be glad to have you care for them; but you know those fish might not do just as you wanted them to, and then we might have a dead fish, a broken globe and worst of all an angry boy." He went back to his seat angry, but in a few minutes he came back smiling and said, "Miss M., if you'll let me care for the fish, I'll try to keep my temper." He cared for them from that time, and I am thankful to say he tried hard to keep his temper.

Another case where nature work has helped me was in the case of a boy who entered my room several weeks after school had begun. All over his face were written obstinacy, sullenness, ugliness and everything disagreeable. I watched him carefully without his knowing what I was doing and concluded that he had made up his mind he was a bad boy because every one expected him to be, so he would not disappoint them. On this conclusion, I thought perhaps I could reach him by asking him to help me clean the boards after school. Unfortunately I asked him before school was out, and he replied, "No, I don't want to." Though failing that time, I determined to keep on till I had found what that boy was interested in. In a few days I was rewarded during a nature lesson to find he had observed a number of things about the plants in our room which few others had seen. "Is this a clue?" I asked myself. It was a rainy day, and the entire school was working at a quiet lesson except Theodore, who showed by his every motion that he did not intend to write the lesson. Apparently I did not see his attitude, but went to him and whispered, "Theo, do you think you could carry the large fern down and put it in the rain without getting wet, yourself?" How the expression of his face changed! He was trusted to do an errand and to care for a *plant,* that which I afterward found was one of the dearest of things to him. Later on, when I gave out some seeds for them to plant at home, I found no one more interested than he, but it was a sort of secret between us. I think, if I had once spoken of it in any way before the class, he would have gone home and pulled up every plant, rather than have anyone else know that he cared. I can not tell anything more of this boy, as he moved away after being with us but two months. I was very sorry to have him leave.

There is nothing concerning which children will talk so freely as live creatures and plants, things which they can watch. In these talks how much a teacher may learn of that inner self which she may never otherwise see; and, now that our Bible is taken out of our schools, how are the children to learn of the Creator of all these things if not through the things which He has created? We are thankful indeed that, though the Book of Life has been taken from them, no one can take the Book of Nature.

When Earth's last picture is painted and the tubes are twisted and dried,
When the oldest colors have faded, and the youngest critic has died,
We shall rest, and faith, we shall need it—lie down for an eon or two,
Till the Master of all Good Workmen shall set us to work anew!

And those that were good shall be happy; they shall sit in a golden chair;
They shall splash at a ten league canvas with brushes of comet's hair;
They shall find real saints to draw from, Magdalene, Peter and Paul;
They shall work for an age at a sitting and never be tired at all!

And only the Master shall praise us, and only the Master shall blame,
And no one shall work for money, and no one shall work for fame;
But each for the joy of the working, and each in his separate star,
Shall draw the Thing as he sees it, for the God of Things as they Are.

Prin. R. J. Round—I have been asked to talk 10 minutes on nature study as it exists in Elmira. Several years ago, when I was principal of a grammar school in Elmira, we were required to observe Arbor day one day in every year, at which we had exercises; and, after we had observed the day for several years, it grew rather monotonous, the same subject recurring every year. I felt at that time if we could have greater latitude and take in not only trees but all kinds of plants and all kinds of life, in other words, if we might call the attention of the children to the life about them, it would be a good thing for the scholars. Just about that time the nature study work of the Junior Naturalists Club of Cornell University was started; and I felt that there was my opportunity, and I think that I was one of the first, certainly in Elmira, who availed themselves of that opportunity. We formed clubs, and we have done more or less work. In the schools of Elmira no work in nature study has ever been required in the course. It has been left optional with the principals, and the principals have largely left it with the teachers, so that the work has been necessarily very crude and fragmentary; but I imagine that most of us are in the same position. It is still in the experimental stage, though it has done a great deal of good. We have accomplished much, though our work has been unsatisfactory. At first we received the leaflets, and we gave as much attention as we could to them. We wrote the letters, and later we have been doing the work in the schoolroom. Last spring Miss McCloskey visited our schools. She brought with her a number of objects to show the children, and she talked to them about the monarch butterfly, which I suppose you know is on the Junior Naturalists' button. She described the green chrysalis with the gold nails; and, as I sat listening to her as she talked to a room full of children, I thought what a beautiful thing it would be if we could have this chrysalis in our room to show to the children. I never had seen the chrysalis of a butterfly. I had seen the cocoons of moths. Those are very common, and most of us have had them in our schoolrooms. I thought if we could only get such a thing as that to show the children, what an interest would be created. It was my privilege to attend the summer school at Chautauqua last summer and become a member of the class in nature study. While there, the larvae of the monarch butterfly were brought into the classroom; and we watched the chrysalides day by day till the butterflies emerged. I felt if I could go home and have that reproduced in our schoolroom it would be a great thing, but I had no idea whether I would succeed or not. I started out one Saturday morning with some of my boys to see if we could find some caterpillars on the milkweed. We found a great many milkweeds, but we did not find a caterpillar. On Monday I told the rest of the class that we had tried and that we had failed, and asked them if they would try. A day or two afterward some of the boys brought in some milkweed larvae with the milkweed, and we made a cage. We had a large glass jar, and we tied mosquito netting over the top. We had several of the cages, and the feeling spread to the other rooms, and in four different rooms we had the caterpillars of the monarch butterfly feeding. To make a long story short, the children watched those with great interest; and finally those caterpillars hung themselves up with the fish-hook shape, as you who have seen them know, and the transformation took place, and the butterfly chrysalis with the gold nails was perfect. We had those in several rooms. We watched them with great interest till finally we were rewarded by having the butterflies come out.

Now, that was the realization of a dream, a dream that I had six months before when Miss McCloskey had been there and told us about these things. None of us had ever seen them. I had lived to be over 50 years old and had never seen such a thing, and yet with no difficulty we realized this dream. The pupils in the four highest grades, numbering 150, saw the metamorphosis. They saw everything except the eggs. We had none of the eggs. If we never do anything more in nature study for those pupils, we have accomplished a great deal; and I never expect to get more pleasure out of any school work than I did out of that experience. This is told as an illustration of what we can all do. I never had any special training in science, and I do not feel myself qualified to do this work; yet the children had the opportunity to observe closely and carefully a most wonderful thing in nature that is going on around us all the while.

We have these clubs in all of our grades of the school from the fourth to the eighth, inclusive. Each member of a club writes a letter a month to Mr Spencer. While the pupils were watching these changes, I assembled two of the classes every morning and for 15 or 20 minutes I talked and read to them about moths and butterflies. I simply made an illustration, made a type of the caterpillar, of the monarch butterfly. We had other caterpillars, and the cocoons were found in the schoolroom. We have had silkworms and the same experience spoken of by the last speaker. Mr Spencer asked us if we would like some of the caterpillars. I said yes, but I did not know how we could feed them. I did not know that there was a mulberry-tree in the city of Elmira, but, on my inquiring of the children, they said, "Yes, there is a mulberry tree in the next yard". That is an illustration of what we can do if we try. We had the leaves brought in and the caterpillars or silkworms fed and the cocoons spun, and we kept them till the moths came out and laid their eggs. So we had the complete metamorphosis.

Of course, the changes took place slowly. The children observed and at the end of the month wrote their letters. In our grammar school conference yesterday, we discussed the subject of composition writing, and I have felt that the nature study work has been a great help to our pupils in the matter of composition writing; and you saw the work there in drawing. The nature study work is very helpful in drawing and composition. The children like to write if they have something to write about. Those of us who in our early days had to write compositions and did not know what to write about had great difficulty; but, if you give children every month some material to think about, and they work it up and take notes, when they come to write, they have something to say from their own experience.

Mention has been made of the excursions and the walks. We have done something of that. Last spring I went out with a number of my classes. Each took along a little basket and a little notebook and pencil. We went out into the woods and fields, and every bird that we saw we made a note of. Everything peculiar about it we noted; and then gathered the wild flowers, as many as we could, and brought them to the schoolroom the next morning. We put on the board lists of the birds we saw. The supervisor in drawing was around that morning and took advantage of the opportunity to give a lesson on drawing these wild flowers. The drawing teachers are ready to cooperate with us; they are glad of the opportunity it furnishes to create an interest in the drawing.

The greatest difficulty I find is this: teachers as a rule are willing and glad to do this work, but they can not do successful nature work without taking some time. They have to provide specimens. Every teacher can do it, I am sure, without any previous preparation. Of course, if a teacher's attention has been directed to the study of botany or of entomology or zoology, she is better prepared for it, but every teacher can find some subject in which the children can be interested. With our modern curriculum, with the multiplication of subjects, the grade teacher has difficulty in finding time. With a supervisor of drawing, music and physical culture, and with a principal who is not particularly interested in the nature study, it is hard for a teacher to get the time to spare. I have been interested in nature study, and my teachers have known it, and have been perhaps more willing to work than the teachers in a school where the principal is not particularly interested. Even in my school I have felt a hesitation in urging the teachers to do this nature study work. I do not know how we are going to solve the problem. Our state superintendent, in his last report, called attention to the fact, and this is not the first time he has done it, of the overcrowding of our courses of study; and he spoke of it in an address to the grammar school principals yesterday morning. I say I do not know how we are going to overcome this difficulty, but I do believe most thoroughly that, if the grade teachers could be given the time to make the preparation, and through all the grades some time of the week could be given to the subject of nature study, there would be a marked improvement not only in the moral character of the pupils, but in all the work done in our schools.

One thing has been a great comfort to me. Mrs Comstock gave utterance to this thought in the talks to the teachers at Chautauqua. She issued for the use of the teachers a syllabus, giving an outline for each grade for each season of the year. There is a great deal of work suggested, and that frightens the teachers. Mrs Comstock said this, and I have said the same thing to my teachers: Do not be afraid to take hold of this work because there is so much to be done. Look over the outline. You will find something there that you are interested in, and of which you have some knowledge; and if in the term you only get the children to study carefully and closely some one thing, you will have accomplished a great deal. I have carried out this thought and, as I told you, made a beginning in our study of the metamorphosis of the monarch butterfly. If we do not do anything more this year than that one thing, I feel that we have done a great deal for those children; and I believe every teacher can do as much. She can find some one object and bring the living creature, either plant or animal, into the room and watch the changes. Call attention to the details and get the children to describe them. That is a beginning, and that beginning we have made.

Saturday, 11.15 a. m.

GENERAL SESSION

A STANDARD COLLEGE ENTRANCE OPTION IN BOTANY

COMMITTEE REPORT[1]

PRESENTED BY PROF. FRANCIS E. LLOYD, TEACHERS COLLEGE, COLUMBIA UNIVERSITY

1 It is founded on the two important reports of the National Educational Association, the report of the Committee of Ten (Washington 1893), and the report on college entrance requirements (Chicago 1899).

2 It is intended primarily as an option for entrance to college, but equally for the education in the high school of the general student who can follow the subject no farther; there are in

---

[1] The committee was appointed by the Society of Plant Morphology and Physiology.

botany no advantages in having the college preparatory and the general educational courses different, at least none that are at all commensurate with the additional burden thus laid on the schools.

3 It should, if possible, be founded on a considerable body of botanical fact learned through "nature study" in the lower schools; it should form part of a four years high school course in the sciences; it should be considered and treated as an elementary or preliminary course leading to second courses in colleges, and colleges accepting the option should make provision to articulate second courses economically with it.

4 The immediate plan of its construction is very simple, namely, to include those topics in the leading divisions of the subject which most teachers now regard as fundamental, either for their value in scientific training, or as knowledge; but the individual teacher is left free to follow his own judgment as to sequence of topics, text and other books and special methods. Advice is occasionally offered, however, on important points in which most teachers are now known to agree.

5 It is designed to yield a mental discipline fully equal in quality and quantity to that yielded by the older subjects studied for the same length of time.

6 The time per week, inclusive of recitation, preparation, and laboratory, should be the same as for any other subject. Where five periods a week with an hour of preparation for each are demanded for other studies, this course should receive the equivalent of two recitation periods with their preparation, together with three double (not six separated) periods in the laboratory and a small amount of outside related work or preparation. Variation from this should be toward a greater, not a lesser proportion of laboratory work.

7 The preparation of records of the laboratory work, in which stress is laid on diagrammatically accurate drawing and precise and expressive description, is regarded as an integral part of the course; and these records, preferably in a notebook, must be presented with the examination paper, and will count one third toward admission.

8 There must be provided
- *a* A full year option
- *b* A half year option
- *c* The possibility of a two year option

Specifications

The full year option, to count as 1 unit or point out of 13 to 15 for entrance, will consist of:

1 A half year devoted to the general principles of anatomy, morphology, physiology and ecology.

2 A half year devoted to the natural history of the plant groups, with classification.

Under special circumstances, though it is not advised, the full year option may consist of 2 enlarged to occupy a year and including the essentials of 1.

The half year option, to count as 1 unit or point out of 26 to 30 for entrance, may consist of either 1 or 2 above, but not of a composite of both.

A half year option consisting of a composite of 1 and 2, though recognized as profitable under some local conditions, is not here included; since, while it is not considered educationally superior, if equal, to 1 or 2 more throughly studied, it will be impossible for colleges to make arrangements to articulate it profitably with their higher courses in addition to 1 and 2; and, moreover, examination boards will find obvious difficulties in providing examinations for it.

The two years option will consist of 1 enlarged to a year, together with 2 enlarged to a year.

1 The half year option in the general principles of anatomy, morphology, physiology and ecology

The fundamental topics are the following:

a In anatomy and morphology

The seed. Four types (dicotyledon without and with endosperm, a monocotyledon and a gymnosperm); structure and homologous parts.

Food supply; experimental determination of its nature and value. Phenomena of germination and growth of embryo into a seedling (including bursting from the seed, assumption of position and unfolding of parts).

The shoot. Gross anatomy of a typical shoot; the arrangement of leaves and buds on the stem, and deviations (through light adjustment etc.) from symmetry.

Buds, and the mode of origin of new leaf and stem; winter buds in particular.

Specialized and metamorphosed shoots (stems and leaves).

General structure and distribution of the leading tissues of the shoot; annual growth; shedding of bark and leaves.

The root. Gross anatomy of a typical root; position and origin of secondary roots; hair zone, cap and growing point; origin of new roots.

Specialized and metamorphosed roots. General structure and distribution of the leading tissues of the root.

The flower. Structure of a typical flower, specially of ovule and pollen; nectar glands; functions of the parts. Comparative morphologic study of six or more different marked types, with the construction of transverse and longitudinal diagrams.

The fruit. Structure of a typical fruit, specially with reference to changes from the flower, and from ovule to seed. Comparative morphologic study of six or more marked types, with diagrams.

Where options 1 and 2 are combined to form a year course, this comparative morphologic study of flowers and fruits may advantageously be postponed to the end of 2, and then taken up in connection with classification of the angiosperms.

The cell. Cytoplasm, nucleus, sap cavity, wall. Adaptive modifications of walls, formation of tissues.

The sequence of topics above given, with the exception of the position of the cell, is that recommended by the committee, but the precise sequence is not considered important.

As to the study of the cell, it is by no means to be postponed for consideration by itself after the other topics, as its position in the above outline may seem to imply, but it is to be brought in earlier along with the study of the shoot or root, and continued from topic to topic. Though enough study of the individual cell is to be made to give an idea of its structure (a study which may very advantageously be associated with the physiologic topics first mentioned under *b*) the principal microscopic work should consist in the recognition and study of the distribution of the leading tissues.

b In physiology

Rôle of water in the plant; *absorption (osmosis), path of transfer, transpiration, turgidity and its mechanical value, plasmolysis.*

Photosynthesis; *dependence of starch formation on chlorophyl, light and carbon dioxid; evolution of oxygen,* observation of starch grains.

Respiration; *necessity for oxygen in growth, evolution of carbon dioxid.*

Digestion; *digestion of starch with diastase,* and the role of digestion in translocation of foods.

Irritability; *geotropism, heliotropism* and *hydrotropism;* nature of stimulus and response.

Growth; *localization in higher plants; amount in germinating seeds, and stems; relationships to temperature.*

Fertilization; sexual and vegetative reproduction.

Though for convenience of reference, the physiologic topics are here grouped together, they should by no means be studied by themselves and apart from anatomy and morphology. On the contrary, they should be taken up along with the study of the structures in which the processes occur, and which they help to explain; thus, photosynthesis should be studied with the leaf, as should also transpiration, while digestion may best come with germination, osmotic absorption with the root, and so on. The student should either try, or at least aid in trying, experiments to demonstrate the fundamental processes underlined above.

c In ecology

Modifications (metamorphoses) of parts for special functions.

Dissemination.

Cross-pollination.

Light relations of green tissues; leaf mosaics.

(Plant societies; mesophytes, hydrophytes, halophytes, xerophytes; climbers, epiphytes, parasites (and saprophytes), Insectivora. Symbiosis)

(Plant associations, and zonal distribution)

The topics in ecology, (particularly the first four and in part the fifth) like those in physiology, are to be studied not by themselves, but along with, and in dependence on, the structures with which they are most closely connected, as cross-pollination with the flower, dissemination with the seed, etc. The fifth and sixth may most advantageously be studied with *g* in part 2, and are to be considered as recommended rather than as *required.*

In this connection field work is of great importance, and for some topics, such as the sixth, is indispensable, though much may be done also with potted plants in greenhouses, photographs, and museum specimens. The committee strongly recommends that some systematic field work be considered as an integral part of the course, coordinate in definiteness and value as far as it goes with the laboratory work. The temptations to haziness and guessing in ecology must be combated.

2 The half year option in the natural history of the plant groups, and classification

A comprehensive summary of the great natural groups of plants, based on the thorough study of the structure, reproduction and adaptations to habitat of types from each group, supplemented by more rapid study of other forms in those groups. Where living material is wanting, some use may be made of preserved or even pictured materials. A standard textbook should be carefully read. The general homologies from group to group should be noted.

In general, in this part of the course, it is recommended that much less attention be given to the lower, difficult and inconspicuous groups, and progressively more to the higher and conspicuous forms, and that at least one third of the time devoted to the groups be given to the spermatophytes. Attention should be called throughout to the economics (relation to man's good and injury) of the forms and groups studied.

Following is a list of recommended types from which selection may be made.

a Algae. Pleurococcus (or Sphaerella), Spirogyra, Vaucheria, Fucus, Nemalion (or Batrachospermum or Polysiphonia or Coleochaete).

b Fungi. Bacteria, Rhizopus, yeast, Puccinia (or any powdery mildew), mushroom.

Bacteria and yeast have obvious disadvantages in such a course, but their great economic prominence may justify their introduction.

c Lichens. Physcia (or Parmelia).

d Bryophytes. In Hepaticae, Radula (or Porella or Marchantia). In Musci, Mnium (or Funaria or Polytrichum).

e Pteridophytes. In Filicineae, Aspidium or equivalent, including of course the prothallus.

In Equisetineae, Equisetum.

In Lycopodineae, Lycopodium and Selaginella (or Isoetes).

f Gymnosperms. Pinus or equivalent.

g Angiosperms. A monocotyledon and a dicotyledon, to be studied with reference to the homologies of their parts with those in the above groups; together with representative plants of the leading subdivisions and principal families of angiosperms.

Classification should include a study of the primary subdivisions of the above groups, based on the comparison of the types with other (preferably) living or preserved material. The principal subdivisions of the spermatophytes, grouped on the Engler and Prantl plan, should be understood.

The ability to use manuals for the determination of the species of flowering plants is not considered essential in this course, though it is desirable. It should not be introduced to the exclusion of any other work, but may well be made voluntary work for those showing a taste for it. It should not be limited to learning names of plants, but should be made a study in the plan of classification as well.

The preparation of a herbarium is not required or recommended except as voluntary work for those with a taste for collecting. If made, it should not constitute a simple accumulation of species, but should represent some distinct idea of plant associations, of morphology, of representation of the groups, etc.

SYMPOSIUM

WHAT OUGHT THE HIGH SCHOOL TEACHER IN EACH SCIENCE TO KNOW? WHAT OUGHT HE TO BE ABLE TO DO? WHAT ARE HIS OPPORTUNITIES FOR SELF-IMPROVEMENT?

Prof. Lyman C. Newell—What I shall say will be confined to the last of the three questions to be discussed in this symposium. The third question, "What are his opportunities for self-improvement?" is important, because it presents so many practical aspects. Perhaps the largest opportunity is access to periodical literature. Magazines devoted to every branch of science are numerous, and no progressive teacher can afford to lose sight of them. It is not always possible to read and digest an article as soon as it appears. Therefore teachers must have some plan of keeping track of helpful articles. Those who have never tried to do this may regard it as an almost impossible operation, but I have not found it so. An hour a month I have found sufficient to enable me to record on cards, about half the size of an ordinary library catalogue card, the title, etc., of all articles in current magazines which I believe will be helpful. As soon as convenient I read the articles, abstract what seems advisable, or, as often happens, purchase the magazine and file it away for future use. The cards are filed alphabetically by topics, the simplest word being placed first, though the exact title is always put on the card. Some such plan is necessary if one is to prepare papers and to keep track of discoveries and the progress of principles. I recommend the card system after a trial of nearly 10 years.

A second opportunity for improvement is general reading, specially in one's special field. Teaching is apt to make one narrow. Our daily work does not open many different channels of thought and interest. Many teachers are deplorably uninformed in the different branches of their subject. So important is this matter in the opinion of the New England Association of Chemistry Teachers that a list of books in chemistry has been prepared by them. This list is devoted to the needs of secondary teachers, though others will find it useful. I have brought a number of copies of this list, and they are at your disposal. Additional copies may be obtained of the L. E. Knott Apparatus Co., 16 Ashburton place, Boston Mass. Many books have recently appeared on new subjects which will soon be taught in the secondary schools, and now is the time for teachers to acquaint themselves with the general outlines of these subjects. This is specially true of physical chemistry and electrochemistry. Several books on these subjects are described in the list just mentioned. In addition to the use of printed lists, teachers should not fail to improve themselves by examining new books as soon as they appear. Many hints are obtained from them. In this connection it may be well to state that teachers should keep track of good books. One's circumstances often change; a book not available in one place may be needed elsewhere. To be a serviceable teacher, one must be prepared to adapt one's self readily to new conditions.

A third means of improvement is illustrated by this very meeting. It has been an inspiration to me to meet teachers who are working in the same line as I, though under different circumstances. In New England we have two science associations, one devoted to chemistry and one to physics. Each has a large membership, and is a source of profit and pleasure to the members. We give and take freely. No one attempts to take without giving in return. The records of the meetings are published in full and are freely distributed.

These three contemporary opportunities for self-improvement may be utilized without adding to our daily burdens, and in time they may become part of our literary recreation.

Prof. Henry R. Linville—I wish to speak of what seems to me to be the difference in value as teachers between the man who has had the conventional college course and the one who has done postgraduate work in a university. If it were possible to find two men of the same capacity, physically and mentally, that could be subjected to the same training up to a certain point, and led into different work after that, I am confident that a practical demonstration of the benefit of thorough work in the best graduate schools could be made. As things are, the comparisons that occur to anyone who thinks on this question are convincing. All of us are familiar with the average college graduate who in the first year after receiving his degree begins his career of teaching. He finds difficulties and in time overcomes them to the satisfaction of himself, his principal and the board. With 10 years of this experience he has made a place for himself in the list of steady and reliable teachers. This man can teach a class in Latin as well as in English or in mathematics, and all of them successfully in a place where the scholar's ideal of good teaching is not likely to be prevalent. Secondary schools are filled with this sort of men, and their presence is responsible for much of the mediocre, humdrum, spiritless work found in these places.

A man who pursues a consistent course of investigation in some special field is being trained (within the limits of his native ability) into the possession of one of the greatest powers of the human mind—the power of independent and accurate judgment. Such a man, with a natural capacity for teaching, can become an immediate force in any institution. He is an abler man than he would have been without his special training. The manifestation of his ability need not be limited to any particular line of work. His judgment has been trained, and the trained judgment may be used in various directions. The teaching of this sort of man has every reason for being characterized by high quality, spirit and inspiration.

When a teacher regards with thorough and intelligent respect the principles of his science, he is undoubtedly in a position to inspire a similar respect for the science in the minds of his pupils. This is the ultimate proof of success.

Saturday afternoon

GENERAL SESSION

STIMULANTS AND NARCOTICS

REPORT OF PROGRESS OF THE COMMITTEE

PRESENTED BY PROF. IRVING P. BISHOP

At the meeting of this association held in New York in 1898 the attention of the council was called to certain discrepancies between the facts of physiology taught in the universities and medical schools and those taught in the public schools of the state. As the result of the discussion which followed, a committee of five was appointed "to ascertain and report what is definitely known regarding the effects of alcohol and narcotics on the human body and to recommend suitable methods for teaching the same in the schools of the state." A careful examination of the bibliography of alcohol alone revealed an enormous mass of matter, and a wide difference of statement on almost every point, even among those best qualified to know. As it was known that the Committee of 50 for the Investigation of the Drink Problem, a nonpartizan organization, was conducting original researches, your committee unanimously decided to defer its final report till the material from that source should be available. Recent correspondence with that body shows that the report of the subcommittee on the physiologic and *pathologic aspect of the* drink problem is now ready, and that it will be in our hands soon. We present, therefore, certain features of our work which show the progress made to date.

Comparison of textbooks used in medical colleges and in the public schools of the state

To illustrate the discrepancies referred to in the opening lines of this report, we subjoin parallel quotations taken from textbooks used in the medical schools and universities and there considered standard and those in general use in the public schools of the state. With one exception—Hutchinson's—the latter are indorsed by the Women's Christian Temperance Union.[1]

---

[1] A part of the following quotations is taken from the advance sheets of the *Report on the Present Instruction in the Physiological Action of Alcohol* of the subcommittee of the Committee of 50 for the Investigation of the Drink Problem. Dr H. P. Bowditch, Prof. C. F. Hodge.

STANDARD TEXTS

It may, perhaps, be said with safety that in small quantities it (alcohol) is beneficial, or at least not injurious barring the danger of acquiring the alcohol habit, while in large quantities it is directly injurious to various tissues.[2]

In practice we find that in many persons a small quantity of alcohol improves digestion; and that by its means a meal can be digested which otherwise would be undigested and so wasted.[3]

In attempting fairly to estimate the action of stimulants, especially of alcohol, one point is of the utmost importance to remember. It is this—alcohol is a food. If alcoholic stimulants were mere disengagers of static force, early exhaustion would be the rule. But as alcohol is a readily oxidizable form of hydrocarbon, it is also a

SCHOOL TEXTS

Alcohol is not a food or drink. Medical writers, without exception, class alcohol as a poison.[4]

Alcohol is universally ranked among poisons by physiologists, chemists, physicians, toxicologists, and all who have experimented, studied and written upon the subject, and who, therefore, best understand it.[5]

Alcohol also is a poison. It deprives the bones of some of their food, and leaves in place of it, a mineral that makes them more brittle.[6]

As alcohol is a poison, it should not be taken into the stomach. What is a poison? Anything is a poison that harms the body and makes one sick. Alcohol does both.[7]

"Is alcohol a food?"

"What do you think about it? (question to the class)—Do you ood as well as a stimulant. In act it is one of the most easily ssimilable forms of food, and very frequently it can be taken and utilized when no other form of food is available. While it is a stimulant, an evoker of force, it also supplies to some extent that force in its readily oxidizable self. The experiments of the late Dr Anstie, and Dr Dupré have placed beyond all question or honest doubt the fact of the oxidization of alcohol within the organism. If alcohol is oxidized in the body, then alcohol is a true food, or furnisher of force.[1]

---

[2] Howell. Amer. Textbook of Physiology. Ed. 2. 1900. p. 359.

[3] Fothergill. The Practitioner's Handbook of Treatment. Lond. and N. Y. 1897. p. 688.

[4] Eclectic, no. 3, p. 5-7.

[5] Quoted from Youmans in Blaisdell's no. 2, p. 232.

[6] Hutchinson. Our Wonderful Bodies, First Book, p. 24.

[7] Hutchinson. First Book, p. 46.

The question of the propriety of the daily use of alcohol by healthy men is at present a very serious one, involving so many moral and politico-moral issues that it can not be fully discussed here. Suffice it to state as obvious inferences from our present knowledge of the physiological action of alcohol, that the habitual use of moderate amounts of alcohol does no harm; that to a certain extent it is capable of replacing ordinary food, so that if it be scanty, or even if it be coarse and not easily digested, alcohol in some form or other, is of great advantage; that in all cases it should be taken well diluted, so as not to irritate the stomach; and that wine or malt liquors are certainly preferable to spirit.

As Liebig also found that this substance exists in the urine of dogs, horses and lions, and as A. Rajowski obtained it from healthy rabbits, it must be acknowledged that our present knowledge strongly indicates that it is formed and exists in the normal organism.[2]

think your body would grow and keep well and strong if you used it instead of bread and meat?"

"No, indeed. We know that alcohol is not a food."[3]

It is important for you to remember that alcohol is a narcotic poison.[4]

This alcohol is a liquid poison. A little of it will harm any one who drinks it, and much of it would kill the drinker.[5]

It must be remembered that in whatever quantity, or wherever alcohol is found, its nature is the same. It is not only a poison but a narcotic poison.[6]

Alcohol a Poison.

A poison is any substance whose nature it is, when taken into the body either in small or large quantities, to injure health or destroy life.

In large doses, in its pure state, or when diluted as in brandy, whiskey, rum or gin, alcohol is often fatal to life. Deaths of men, women and children from poisonous doses of this drug are common.

In smaller quantities, or in lighter liquors, beer, wine and cider, when used as a beverage, it injures the health in proportion to the amount taken.[7]

If on the other hand, you take into your stomach a little alcohol, it receives no such welcome. Nature treats it as a poison and seeks to rid herself of the intruder as soon as possible. Every organ of elimination, all the scavengers of the body—the lungs, the kidneys, the perspiration glands, at once set to work to throw off the enemy. The alcohol thus eliminated is entirely unchanged. It can not then be treated as an aliment or food.[8]

---

[1] Fothergill. Practitioner's Handbook of Treatment. Ed. 11. Lond. 1897. p. 254.

[2] Wood, H. C. Therapeutics, p. 372.

[3] Health Series, no. 1, p. 30 ff.

[4] Eclectic Series, no. 2, p. 31.

[5] Pathfinder Series, no. 1, p. 41.

[6] Authorized Series, no. 8, p. 58.

[7] Dulaney's Series, no. 2, p. 46 ff.

[8] Steele's Hygienic Physiology. 1884. p. 164.

Conflicting statements like the above could be multiplied far beyond the limits of this report, but enough have been given to show that, in the interpretation of facts, there is a lack of concord which is no longer tolerable.

.Opinions of the committee regarding the effects of alcohol

In attempting to select from the material at their disposal such facts as might be safely taught, your committee has endeavored to weigh evidence carefully. When possible, it has availed itself of the latest research, placing much confidence in experimental inquiry where it has been carried on with due care and regard for accuracy. That there may be no misunderstanding as to the meaning of terms, the following provisional definitions have been adopted:

Stimulant. An agent which temporarily quickens some functional or trophic process. It may act directly on the tissue concerned, or may excite the nerves which effect the process, or paralyze the nerves which inhibit it. Stimulants comprise certain medicinal substances, as ammonia, alcohol and ethylic ether, as well as physical conditions such as warmth, cold, light, or electricity, esthetic effects, as music and other products of art, and emotions of various kinds, as joy, hope, etc. Stimulants have been divided into general and topical, according as they affect directly or indirectly the whole system or only a particular part. *Century Dictionary.*

Narcotic. An agent which directly induces sleep, blunts the senses, and in large amounts produces complete insensibility.

Poison. A substance which when introduced into the body causes disease or death.

Regarding the influence of quantity in producing toxic effects there is much controversy. One class of physiologists take the view that alcohol in any quantity is a poison, and the other, while freely admitting that pure alcohol or even strong alcohol, in large doses, may produce poisonous effects, believe that in small or moderate doses it is harmless or positively beneficial.

The former view is exemplified by the following extracts:

"Alcohol is a true narcotic even in small doses."[1]

---

[1] W. S. Hall. Elementary Anatomy, Physiology and Hygiene. 1900. *p. 118. (Indorsed by* W. C. T. U.)

"Alcohol is a poison of the narcotic class with a special tendency to act on the brain and nervous system."[1]

"There are no dividing lines on one side of which the poisonous action of alcohol can be seen, while on the other it is absent."[1]

"It is a scientific absurdity to assume that alcohol or any other substance is not a poison in small quantities but it is in large quantities."[2]

This view, however, is not that generally held by physicians and the authors of standard texts, who, with few exceptions, discriminate between the effects of large and small doses. For example, the *American Textbook of Physiology* says (p. 359): "The effect of alcohol upon the body evidently varies greatly with the quantity used." Indeed it seems probable that the effects of a drug may differ not only in degree but in kind. Prussic acid is a very deadly poison, and yet nature has put it into fruits which we consume not only with pleasure but also with impunity. The same may be said of oxalic acid, citric acid, etc. Even common salt may act as an emetic. Sound, light, heat and electricity furnish similar illustrations. In the judgment of your committee the same principle applies in the case of alcohol. While undoubtedly poisonous in concentrated form or in large quantities, it is apparently not so to adults when it is taken in small quantities and sufficiently diluted.

In attempting to decide what facts regarding the use of alcohol and its effects on the body may be safely taught, your committee has encountered an array of conflicting evidence which is extremely perplexing. There are very few points on which there is absolute agreement; in some cases the statements regarding the same topic are diametrically opposed.

---

[1] "Alcohol as a Causative Factor in Disease of the Central Nervous System." T. D. Crothers M. D. Reprint from Journal of the Amer. Medical Ass'n. Ap. 9, 1898. p. 2 and 7.

[2] From a letter to the committee dated Dec. 18, 1901, signed by the three members of the special committee of the Onondaga co. Woman's Christian Temperance Union.

In view, also, of the probability that the report of the Committee of 50 for the Investigation of the Drink Problem will be published during the coming year, your committee has decided to postpone till the next meeting of this association its conclusions as to the action of alcohol on the various organs.

But, in order that there may be no misapprehension as to the convictions of the committee on certain practical points of supreme importance, we submit the following opinions and recommendations.

1 All writers agree that an excess of alcohol impairs certain functions of the cerebrum, for example, attention, memory and self-control, and that many cases of insanity are due to such excess.

2 What constitutes excess will differ with individuals, with occupations and with other conditions. On the present occasion your committee does not undertake to prescribe the limit of safety for the average adult.

3 The committee does not consider that the stimulative action of alcohol on the system as a whole has been demonstrated, nor is it aware that any authority claims that in health or under ordinary circumstances, alcohol is an *economical* food, whether for the production of heat or for the protection of fat or proteid.

4 As a matter of fact, the average man in health and under ordinary circumstances disregards these possible rôles of alcohol and takes it because of its flavor or because he finds it conducive to his personal comfort or to good-fellowship.

5 Your committee believes that *spirits* should never be used as beverages unless largely diluted, and that alcohol in any form should be taken only at meals and after the work of the day is done.

6 Youths, say under 21, should abstain altogether from alcohol, excepting under specific medical advice.[1]

---

[1] The importance of this matter and the natural indisposition of youths to refrain from what is permitted their elders lead the committee to state the grounds of their recommendation categorically as follows:

1 Most parents prefer that their sons should abstain till of age.

2 Several college presidents have advised their students to abstain.

Opinions of educators on the present methods of teaching physiology

During the past year there have been conducted three separate inquiries, viz: (1) by the chairman of the committee; (2) by the chairman in conjunction with F. N. Jewett of the Fredonia (N. Y.) Normal School; (3) by J. E. Peabody as chairman of the subcommittee on teaching.

1 For the purpose of ascertaining the present status of physiology teaching in the state, circular letters of inquiry were mailed by the chairman of the committee to 450 teachers, the

---

3 Among those who hold very liberal views as to the use of wine by adults, an experienced physician and an expert investigator of the whole subject wrote, respectively, as follows: "I exhort all young people in health not to adopt the practice of drinking wine." *Dr James Jackson* "For youths, say under 25, the proper rule is either no alcohol or very little indeed." *F. E. Anstie*

4 Analogous restrictions based on age are commonly recognized. The infant takes no solid food; the child retires early; the boy is spared severe labor; the responsibilities of marriage, of society and of political life are postponed till a certain development of body and mind has been attained. Is it not then prudent for the youth to defer the use of so potent an agent as alcohol at least till his majority is reached?

5 Seldom, if ever, is there at the outset a real liking for the taste of alcoholic beverages; on the contrary, their use is commonly begun in thoughtless imitation of older persons or of foreigners; an unworthy motive for doing anything of doubtful utility.

6 Comparatively few students live at home or take their meals at private clubs. At school and college boarding tables alcoholic beverages are seldom served; consequently they are likely to be used, if at all, at saloons, where the other conditions are more or less undesirable, and with little or no accompanying food. It is universally admitted that both the local and the general effects of alcohol are most pronounced when taken on an empty stomach.

7 To gain or hold places on athletic teams abstinence is generally required. Even German corps students are beginning to recognize the incompatibility of excessive beer drinking with proficiency in fencing.

8 The foundations of inebriety are commonly laid early. C. L. Dana found that of 210 inebriates nearly all began to drink before 30, and about two thirds before 20. *Medical Record*, July 27, 1901; *Quarterly Jour. of Inebriety*, Oct. 1901.

9 Youth is the age of peril; temptations abound without; appetites and passions are foes within; of all periods of life, in this should a man be ever "on guard," and protected by the community.

10 Habits are most readily and firmly established in youth. Of all the most valuable is the habit of self-control. "The world belongs to those who can control themselves"; but the man who uses alcohol in excess never can do that.

greater part of whom exercise some supervisory function and for that reason were supposed to have superior opportunities for knowing actual conditions. To avoid, as far as possible, a preponderance of local sentiment, these circulars were distributed over the entire state in cities, towns and villages of 1000 or more inhabitants. Of these circulars 203 were filled out more or less completely and returned. The replies are classified as follows:

Union and high school principals	106
City superintendents	32
Village superintendents (villages of more than 5000 pop.)	14
City grammar school principals	22
Special teachers of physiology	17
Normal school principals	7
Grade teachers	5
Total	203

For convenience, the questions and analyses of answers will be stated together.

Question 1 Do you regard as excessive the time now required by law for the study of physiology?

To this 139 or 68% answered "yes" and 63 or 31% answered "no."

Question 2 If excessive, would you change by decreasing subject-matter, or by limiting instruction to fewer grades?

Of the 126 answers, 100 or 79% were in favor of limiting instruction to fewer grades, five would decrease subject-matter, and 21 would do both.

Question 3 In the latter case, to what grades (school years) would you confine it?

To this 120 answers were received. Of this number 40 would begin work below the 6th year, and 80, or two thirds, would begin at the 6th grade or above. Of the latter division, 34 would begin at the 6th grade, 18 at the 7th, 18 at the 8th, nine at the 9th, one at the high school.

There were also some who preferred confining the work to a shorter time than four years. As a rule these were from the teachers who believe in teaching the subject as a science only, and in the higher grades or high school.

Question 4 In which school year should a textbook in physiology be first put into the pupil's hands?

Answers: 1st year, one; 2d year, one; 3d year, four; 4th year, 11; 5th year, 26; 6th year, 35; 7th year, 35; 8th year, 28; 9th year, six; 8th, 9th or high school, seven.

The reason given for not wishing to introduce a book earlier than the year chosen was in 38 instances, immaturity of the pupil; in six instances, difficulty of maintaining interest for so many years; and in four instances the belief that other work was of more importance. It is worthy of note that 80% of those answering preferred to begin the use of text in the grades included between the 4th and the 9th.[1]

Question 5 After having studied physiology through the grades, does the pupil now enter the high school with increased or diminished interest in the subject?

---

[1] To ascertain how the point of view affected the answers, an analysis was made of the replies to the foregoing questions from superintendents, grammar school teachers and special physiology teachers. Of the 46 city and village superintendents, 64% answered "yes" to the first question. Out of their 28 replies to question 3, 64% wished to confine the work to grades above the 5th, and also to introduce the text at the 6th or some higher grade. The city grammar school principals showed a marked preference for physiology, eight voting "yes" and 14 "no" to question 1. Of the eight who replied to question 3, six were in favor of confining the work to the grades above the 5th. Of the whole number, 22, 72%, either did not answer the third question or would teach the subject in all grades. In answer to question 4, 10 of the 22 would first introduce a textbook above the 5th grade. Of the special teachers of physiology, seven would make of it a high school study, while one would confine it to college.

From the above it will be seen that the attitude of the city superintendents toward these questions does not differ widely from that of the whole group of teachers under consideration. That the grammar school men should favor physiology throughout the whole course to a greater degree than the other groups is a noteworthy fact. It would be interesting to know whether the preference is due to the change which a new subject gives to the routine of grammar school studies or whether the principal sees, in his closer relation to the pupils coming from all ranks of life, a greater usefulness in teaching pupils to abstain from tobacco and alcohol.

128, or nearly 63%, replied that the interest was diminished; 35 had noticed increased interest, and 13 more were doubtful. The reasons for diminished interest were not usually assigned. In 11 cases, weariness of the subject due to repetition was given as the cause; in three instances, disgust; and in nine the fault was laid on the teacher. One high school teacher of physiology preferred pupils who had not previously studied the subject to those who had; another said the pupils who studied in the high school alone passed the Regents examination in the same time and with as high marks as those who had taken the regular physiology work through the grades before entering the high school.

Question 6 What beneficial results do you observe in your school or community through the teaching of the effects of stimulants and narcotics?

To this question, 177 answers were given. Of this number 23 expressed doubt, 28 had seen beneficial results, and 120, or 62%, had noticed no effect whatever. The beneficial results were stated to be better habits or a healthy sentiment in favor of abstinence from the use of alcohol or tobacco. One principal said that not a single boy in his high school smoked or used alcoholic drinks. Five more gave a qualified answer, saying the results were beneficial under certain conditions. One was noncommital but said that the two breweries of his town were still doing business.

Question 7 Do you observe any detrimental results from the same cause?

132 answered " no " to this question, 13 gave instances where boys had experimented with tobacco or alcohol, either out of curiosity to learn its properties or a desire to "spite the teacher". It was believed that this action would not have been taken had not the study of the book suggested it. Another reason given by several was that the teaching in school was contrary to the child's own experience. " Many parents of children in my district ", writes one ward principal, " drink moderately but regularly, and it is impossible to convince such pupils that

the use of alcoholic liquors is harmful ". Waste of time, weariness on the part of pupil, disgust, loss of interest, false ideas regarding stimulants and narcotics, formed an aggregate of 18 additional cases where the results were considered bad.

Taken together, the answers to questions 6 and 7 do not show as marked results as might fairly be expected from a study which has been a compulsory part of the education of every school child in the state for five or more years. On the other hand, there is now no means of knowing how far or in what direction the teaching now in progress may affect the future character of the child.

The present system is based on the idea that, if the child knows what is bad for him physically, he will avoid it. The evidence shows that this is not always so. A prominent teacher writes: "A cigarette fiend won the last W. C. T. U. prize in our school for an essay showing the effects of tobacco. He still keeps on using cigarettes."

Question 8 What textbook do you use? Is it satisfactory? Why?

To this 113 answered "yes", 26 "fairly", 38 "no" and 18 "not entirely." The feeling expressed was in the main favorable, indicating that the book answered the purpose for which it was designed. "Satisfactory," "As good as the law allows," "Complies with the law," "Meets the Regents' requirements," are answers needing no comment. Some of the juvenile books were severely criticized. "Wishy-washy," "goody-goody" and "nothing in it" were descriptions applied by three out of five teachers using one particular series. Several objected to the treatment of stimulants and narcotics as given in the texts, and others said they could teach the subject better without a book.

Question 9 Do you look favorably or unfavorably on the use of highly colored pictures illustrating morbid physiologic conditions?

The answers to this were, "unfavorably," 126; "favorably," nine; favorably with qualifications, six. "They give exaggerated and false impressions," "They create morbid tendencies," "Only normal types should be shown to children," "Sensational," "Unpsychological," "Vice is a monster," etc., express the general trend of opinion regarding this means of illustration.

Question 10 What changes, if any, would, in your opinion, improve the present system of teaching physiology?

The changes suggested showed a wide range of opinion. 12 teachers would leave the questions of quantity of matter and methods of presentation to the teacher, to the local authorities, to the Regents or to the superintendent of public instruction. 18 were in favor of putting the subject on the same basis as other studies. 52 would concentrate the time on fewer grades, making the work oral and hygienic below the sixth year. There was also a tendency in this group to emphasize hygiene and to do less with the topics of stimulants and narcotics.

2 A joint inquiry was conducted by F. N. Jewett and I. P. Bishop with the physiology classes in the Fredonia and Buffalo normal schools to ascertain if possible what the pupils had gained from previous study and what was their attitude toward the subject.[1]

The two classes aggregated 74 pupils, all above the age of 17. Their work includes both subject-matter and method of teaching.

Question 1 How many have studied physiology through the grades, or an equivalent amount, under the present state law? 50 had done so.

Question 2 How many have ever felt that they were getting too much physiology? None.

Question 3 How many have ever felt that they wanted more of the subject? 15 answered "yes".

Question 4 In how many cases has the interest in physiology been greater than the average interest felt in other subjects? Seven responded.

---

[1] These questions were written out and read to the classes, all possible care being taken to avoid influencing the pupils' answers.

Question 5 In how many cases has the interest in this subject been less than the average interest felt in other subjects? 37 responded.

Question 6 How many can trace their aversion to the use of alcoholic drinks, or their disapproval of the same, to the teachings of the physiologies? None responded. (Much merriment in the Buffalo class)

Question 7 How many have ever known of others whose aversion to the use of alcoholic drinks was due to what they had learned of the subject from textbooks? One pupil knew of two cases occurring in the 9th grade of a certain school.

Question 8 How many have ever known of the correction of bad habits relative to the use of alcoholic drinks because of what was learned of their nature in school? None.

Question 9 How many have studied this subject where charts were used showing abnormal conditions of the organs? 22 had.

Question 10 In how many cases did the charts help to render the subject impressive? Two.

Question 11 Why did the charts fail so largely to impress the subject-matter? One said it was because some of the charts were not true, that their untruthfulness was recognized at the time. Another said that the children, inclusive of herself, were too young to understand the charts. A third said the charts were disgusting.

3 A third set of questions was sent out by J. E. Peabody to the physiology teachers in the high schools of the cities and larger towns of New York and New England. Copies of the paper were also sent to college and medical school professors and to prominent members of the Committee of 50. The circular was as follows:

1 The present state law prescribes that

The nature of alcoholic drinks and other narcotics and their effects on the human system shall be taught in connection with the various divisions of physiology and hygiene as thoroughly as are other branches in all schools under state control, or supported wholly or in part by public money of the state. All pupils . . . below the second year of the high school and above the third year of school work . . . shall be taught and shall study this subject every year with suitable textbooks in the hands of all pupils for not less than three lessons a week for 10 or more weeks. . . . For all students below high school grade such textbooks shall give at least one fifth of their space, and for students of high school grade shall give not less than 20 pages, to the nature and effects of alcoholic drinks and other narcotics. This subject must be treated in the textbooks in connection with the various divisions of physiology and hygiene, and pages on this subject in a separate chapter at the end of the book shall not be counted in determining the minimum.

Is it desirable to advocate any change in this state law? If so, what change should be made?

2 Should we emphasize, in teaching pupils, the difference between the effects of moderate and excessive use of alcohol?

3 If this distinction is made, shall we call the attention of boys and girls to descriptions of *delirium tremens*, hobnailed livers, etc.?

4 Authorities differ widely in respect to the effects of the *moderate* use of alcohol. Many of the most eminent physiologists claim this moderate use of alcohol is not injurious. In view of these facts, should pupils ever be taught that alcohol is always a poison?

5 Prof. Atwater's experiments seem to prove conclusively that alcohol in small quantity can be used like sugar, starch and fat for generating heat and muscular energy. Is it wise to describe these experiments to classes? (*See* Atwater's articles in *Harper's Monthly*, October and November 1900; *Outlook*, 1899. v. 62 and 63)

6 Statistics from the United States census in regard to pauperism, crime, insanity, and the cost of drunkenness are telling arguments against the present use (or abuse) of liquors in this country. Should these statistics be given in a course in physiology?

7 The rules of most corporations prohibit the use of intoxicants. Is it well to present to pupils this business argument for abstinence?

8 Please suggest the authorities that give the fairest view of the effects on the human body of alcohol and narcotics.

9 Shall we emphasize in teaching the difference in the effect of tobacco when used by youths and by adults?

10 What is the best form for our report, a series of categorical statements or a succession of quotations from authorities?

Nearly 100 replies were received, and the answers therein contained were tabulated.

In reply to question 1, relative to the state requirements concerning so called "scientific temperance instruction", only four expressed themselves as satisfied with the present law. Two others are in doubt as to the effect of the statute. All the rest condemn it either in part or *in toto*. The various grounds of dissatisfaction may be stated as follows:

a Too much time in the curriculum is assigned to the subject of alcohol and other narcotics. Many suggest that its consideration be omitted in several of the grades, stating that the wearime repetition required by law leads either to indifference on e part of the pupil or to actual hostility toward the subject.

b The pressure brought to bear on textbook writers, because the law, makes most textbooks unbalanced in their propor-ons, if not, as is often the case, actually untruthful in their atements.

c The statute fails to accomplish what it was destined to :complish, viz, the growth of an intelligent sentiment against ie evils of intemperance. Teachers declare that the teaching f physiology and hygiene, which ought to be of great help in ie every day life of the pupil, is becoming synonymous with :aching the effects of alcohol and narcotics; indeed in some :hools the textbooks in the subject are called by the pupils the liquor books."

After tabulating the answers to question 2 on the circulars :turned, we find that the distinction between the effects of oderate and excessive use would be emphasized by three fourths f the writers. About two thirds of the papers say that the ktreme effects of liquor in cases of *delirium tremens* and athologic livers should not be portrayed in a course in physiol-gy given to boys and girls. Only one third, on the other hand, :commend the presentation of Prof. Atwater's recent impor-int experiments on alcohol as a possible source of energy. In nswer to the question, "Should pupils ever be taught that lcohol is always a poison?" four fifths of the papers register decided no.

Turning now from the physiologic aspect of the question to its ioral and economic bearings, we find substantial agreement iat perhaps the best arguments against intemperance are those irnished by the statistics of pauperism, crime, and insanity. early all agree, too, that the business argument in favor of ›stinence or strict temperance should be advanced, but several f the writers protest against introducing either of the argu-ents just named into a course in physiology and hygiene.

As already stated, your subcommittee has devoted most of s attention to the consideration of the alcohol question as affecting the high school course. This was deemed advisable in view of the limitations of time. We believe, however, that the proper study of physiology in the elementary grades is of even greater importance, because of the practical teachings of hygiene that may be thus widely diffused. In this connection we are permitted to quote the following statement which will soon be published by a joint committee of the Teachers Association and Male Principals Association of New York city. This committee was appointed to recommend changes in the present New York city course of study.

> The committee deplore especially the unwise and burdensome teaching of physiology foisted upon our curriculum by an arbitrary state law. We earnestly recommend that the teachers associations and school authorities of the city initiate some movement looking toward a more rational use of the time that is now devoted to so called "temperance physiology." This teaching is intended to give children an abhorrence of alcoholic drinks; but, by the unpedagogic methods it employs, it succeeds only in cultivating in children an abhorrence of the beautiful and useful science of physiology.

Conclusions of the committee from the preceding investigations

1 Physiology is the only subject in the curriculum that is dominated by legislative enactment. The result seems to be that instruction is commonly given in a perfunctory way, or that the provisions of the law regarding temperance instruction are disregarded. It should be remembered that no law, however stringent, can bring about effective teaching when the statements presented to the pupils are questioned or disbelieved by the teacher.[1]

2 The teaching of the effects of stimulants and narcotics under the present system has not produced any marked change of sentiment in the young either for or against their use. If any change exists, it is entirely disproportionate to the outlay of time and effort which has been made.

---

[1] While we recognize the importance of legislation relating to the subject and acknowledge the great service which the members of the Woman's Christian Temperance Union have rendered in the cause of temperance instruction, your committee is of the opinion that our present law could be amended so as to be more acceptable to practical educators and to promise more satisfactory results.

3 Whether the matter taught is or is not excessive in amount, it is unwisely distributed through the course, and there is frequent and unnecessary repetition.

4 As the result, diminished interest and dislike of the subject prevail.

5 The preponderance of opinion expressed indicates that instruction could profitably be limited to fewer grades, those between the 5th and 8th being preferred.

6 The use of textbooks should not be made compulsory earlier than the 6th grade, if at all.

7 Though the textbook may not always be satisfactory, the teachers do not regard this fact as a marked impediment to their work.

8 Charts showing morbid physiologic conditions are generally condemned.

9 The evils of alcohol and narcotics can be presented most effectively from the moral and economic point of view.

Recommendations of the committee

1 The New York State Science Teachers Association should urge that the present law be modified in such a way that teachers of physiology be given more freedom to decide as to the character and content of their teaching, and writers of textbooks more freedom as to the space devoted to the subject and its location in the volume.

2 We are interested in the recent changes effected in the law in the state of Connecticut, and look with favor on its present provisions. But, before recommending similar specific changes in our law, we deem it wise to allow a reasonable time to elapse for observation of the working and results of that law.

3 So long as the existing statute remains in force, if truthful instruction is to be given in the subject, the possible benefits of alcohol when prescribed by physicians should be conceded. The difference in the effects on the human body of fermented beverages (beer and light wines) and distilled liquors should also be noted. Emphasis should be laid, too, on the greater

susceptibility of young persons both to direct injury from the use of alcohol in any form and to the danger of forming undesirable habits. Pupils should be allowed also to know that there is wide disagreement among authorities as to the physiologic effects of a strictly moderate use of liquors by adults. On the other hand, attention should be called to the fact that the moderate use of alcohol very commonly leads to excess, and the teacher should emphasize the fact that an immoderate use of liquors weakens the tissues so that they are made more susceptible to disease.

4 Finally, if the teacher wishes to present the strongest arguments in favor of either total abstinence or strict temperance, and thereby fulfil the spirit rather than the letter of the law, your committee recommends that comparatively little time be spent in trying to teach the physiologic effect of alcohol and tobacco. Let us frankly admit that we are discussing not so much a question of physiology as one of morals and economics, and let us devote the larger part of the time required by law to a treatment of the question from the moral and economic standpoint.

IRVING P. BISHOP
BURT G. WILDER
GAYLORD P. CLARKE[1] } *Committee*
ELI H. LONG
JAMES E. PEABODY

ALCOHOL PHYSIOLOGY IN THE PUBLIC SCHOOLS

BY PROF. W. O. ATWATER, WESLEYAN UNIVERSITY

Mr Chairman, ladies and gentlemen: The subject proposed for this afternoon is alcohol physiology in the public schools. Your committee have, however, asked me to repeat the substance of an address delivered before one or two other educational gatherings and, in so doing, to recapitulate briefly what I understand to be the outcome of the latest experimental inquiry regarding the physiologic, and specially the nutritive, action of alcohol and to say something also about the kind and amount of instruction which should be required by state legislation and should be given in the schools.

---

[1] Unable on account of illness to take part in the final work of the committee.

If I may be excused for the indiscretion of giving the conclusions of my address at the beginning, they will be somewhat as follows. The amount of teaching of temperance physiology and the space given to it should be much less than are required by the legislation of a considerable number of states, including your own. The kind of teaching should be that which agrees most closely with the attested principles of physiologic science, that which is both scientifically and pedagogically most reasonable.

This, in my judgment, means a material modification of the legislation in many states, and an equally important change in the character of a large amount of the textbook instruction. These changes I believe to be called for in the interest of sound science, sound pedagogy, sound morals and effective temperance reform.

In this connection I am inclined to say a word in behalf of another subject. When we consider that "half the struggle for life is a struggle for food," that "half or more than half the earnings of the wage-earner is spent for the nourishment of himself and family," that not only a man's power to work but also his health, are largely affected by his food, that some of our most skilled hygienists are telling us that a large part of the disease which embitters life and hastens death is due to avoidable errors in diet, that more harm comes to the health of the community from erroneous habits of eating than from the habitual use of alcoholic drink, that economists, philanthropists and divines are urging more and more earnestly the need of attention to such subjects, are we not justified in asking if a little more room can not be found for it in the school curriculum; if some of the time and space now devoted to alcohol physiology might not be better given to food and nutrition in general?

But after this digression, let us come back to our subject. The purpose of all our instruction is to impart knowledge, provide mental discipline and build character. The temperance instruction has, in addition, a special purpose, namely, to promote moral reform. The so called "scientific temperance instruction" current in our schools seeks the latter purpose by impressing on our children the belief that science demonstrates that alcoholic beverages, even in very small quantities, are injurious to health. To enforce this teaching two means are adopted. One is the legislation which now requires the general subject to be taught in the public schools of all the states of the Union, I believe, save one. The other is found in the so called "approved" textbooks which put the special doctrine in the desired form. The same powerful agency which has secured this legislation—and the achievement is most noteworthy—has been able to influence and sometimes to control, in a large measure, the character of this instruction in the schools, by favoring the textbooks which have, and opposing those which have not its official approval.

I doubt if it is quite true, as the leaders of this great educational movement assert, that physiology as conformed to the doctrine of total abstinence is being taught to 16,000,000 children in the United States, because even the present combination of legislation and textbooks does not insure its being so taught in all schools; but the extent of the teaching is very great. The whole is accomplished by such diligence and such moral earnestness, that it has thus far been almost invincible.

Thus it comes about that we have in the United States a great educational movement which is attempting to build moral reform on a basis of scientific doctrine which the best scientific authority disapproves. Perhaps the matter has not occurred to you all in just this light before, but is not this a fair statement of the case?

A large and increasing number of men of science are coming to realize that scientific error has found its way into the curriculums of the schools and are earnestly considering what shall be done to correct it. A large and increasing number of intelligent and conscientious teachers are coming to feel more and more deeply the harm which comes from what they consider to be false science and wrong pedagogic methods and are earnestly considering how they may be freed from the responsibility of the teaching, and how the children in their care may be freed from the harm that it brings.

We often hear the statement that nothing in the public education of our time has met with so general or so earnest disapproval from the best educators and most conscientious teachers as have the so called approved physiologies and the scientific temperance instruction. How true this is, I am not competent to judge. Certainly nothing I have ever known in any educational system has seemed to me to be so unanimously condemned by scientific specialists as a considerable part of the physiologic doctrine regarding the action of alcohol, which this instruction promotes. This is a strong statement. I should feel unwarranted in making it without adding another consideration, namely, that this same instruction has behind it an immense amount of earnest moral conviction. In every state of our Union, save one, are laws requiring temperance physiology in the public schools. This fact in itself is a remarkable phenomenon. It would have been impossible without an amount of conviction on the part of the best elements of the community which can hardly be overestimated. The movement has the support of a great body of people, profoundly interested in education and morals, tremendously earnest in their self-sacrificing efforts to promote temperance reform, convinced that the present teaching is called for and proper, and determined that it shall be enforced.

There is a clash between physiologists and teachers on the one hand and moral reformers on the other. Both are seeking the same object, the welfare of the children who are to be our successors, the building up of the public opinion of the future for the sake of the welfare of the future. On the main issue we are united; we differ as to the method. What is to be done about it?

The first need, I think, is that the public understand the situation. If the real import of this legislation, the kind of scientific doctrine it was intended to introduce, the conflict between that doctrine and what is commonly accepted by scientific authorities and is believed by wise and conscientious educators had been understood, I can hardly believe that the legislation could have become so general. Earnest reformers have seen a great physical and moral evil to be met and have believed that this was the way to meet it. All they have asked of the public has been an act on the statute book to require better instruction in the schools. This the legislatures have been led by public opinion to grant. I think the time has come for teachers to take up the question and show how the legislative and other influences have been utilized to force into our public school education an element which is scientifically, pedagogically, and ethically, most unfortunate.

I think it is safe to say that our present legislation has been introduced without a fair understanding of the facts. Its promoters have seen very clearly one side of the question, the awful harm which is wrought by alcohol. Wives and mothers, in thousands and in millions, feel with a force that outstrips all opposing argument the curse which drinking brings to homes, to hearts and to lives. Husbands and fathers, clergymen and philanthropists sympathize with them. Earnest men and women, impressed with this feeling, have believed, and honestly believed, the fundamental doctrine which the legislation is intended to enforce. They have said: "Let us see to it that the effects of alcohol are taught to our children. Let us fortify them against temptation. Let us provide for the temperance sentiment of the future by the education of the youth of the present." The appeal to the legislator has thus been backed by the moral sense of the community. There has been protest against the legislation, a protest rational and earnest, but unorganized and ineffectual.

The surprise with which many intelligent people receive the statement of the real facts which physiology teaches is, in itself, an indication of the misunderstanding on which this legislation has been based and which the teaching has fostered. While I am in the fullest sympathy with the purpose and while I would not oppose all legislation of this kind, I believe, as I know many of you believe, that in its present form, the legislation is unfortunate and ought to be changed. I do not believe, however, that it will be changed till the subject comes to be clearly understood by the public at large. With that clear understanding of the real facts and principles, I believe that the public will demand that the laws on our statute books be made more rational, and I believe that the conservative and influential promoters of temperance reform will unite with educators in other states, as they have done in Connecticut, to secure such changes in our legislation and in our textbooks as will best conduce to the end which we all so earnestly desire.

The principle I wish to urge is this: if the alcohol physiology now being taught in our public schools as a branch of science is scientifically correct, then it can not be pedagogically or ethically wrong, and there is little reason for my discussing the subject today. But, if it does not tally with the most reliable conclusions from scientific observation and experiment, if what is taught as truth is half truth or partial truth, if doubtful theories are set forth as settled facts, if a rule of conduct is based on an unsound theory, if the attempt is made to improve the morals of the men of the future by a wrong teaching of the boys of today, that educational policy is pedagogically and ethically wrong and ought to be altered.

As teachers you know the current textbooks; may I invite your attention to the opinions of leading authorities regarding the physiologic and more specially the nutritive action of alcohol?

Opinions of leading authorities

The physiologic action of alcohol is very complex, and the views of physiologists generally regarding the different details are naturally divergent. Let us take, for instance, the much discussed question as to whether alcohol is food or poison.

First of all we must have a clear understanding of what we are talking about. A given substance taken into the body may act in a variety of ways. Meat, beefsteak for instance, which is universally called a food, supplies the body with material to build up its tissues, repair its wastes and furnish it with energy in the form of heat to keep it warm and muscular power for work. It also has an action on the nervous system which is not yet fully explained but may perhaps be called stimulative. Taken in excess, it may be injurious; its action is then pathologic. Being thus injurious, it might under these circumstances be called poisonous. Arsenic is sometimes taken as a medicine, and as such is believed to be useful, though we do not know exactly how or why it is so. But arsenic has no value whatever as nutriment and therefore can not be called in any sense a food. In more than minute doses it is deleterious or fatal. It is a true poison. There are certain vegetable products which, fed to animals, supply nourishment, but at the same time are injurious, so that they can not be used for food. Chemists have analyzed some such substances and found ingredients which are nutritious and others which are injurious. That is to say, some substances are clearly foods, some are clearly poisons, some act in both ways. How, then, shall we class alcohol? What I shall attempt to show you is that the results of the most valuable scientific research and the opinions of the leading physiologists of the world unite in saying that it may be either food or poison or both according to circumstances.

Alcohol is not like the meat or the seed, a complex material made up of different ingredients. It is a simple chemical substance. Nevertheless, it has very different actions. A chemist can analyze the seed and separate the parts which are nutritious from those which are poisonous. But he can not do this with alcohol. When the physiologist experiments on its action, he has to take it as a whole. This complicates the experimenting and makes the interpretation of the results difficult.

When we come to consider the dietetic use of alcohol, however, we must take into account not only its direct value for nutriment but also its indirect action, as for instance, its effect on digestion. So likewise when we consider its pathologic effect, we must take into account its indirect action on the nervous system. Indeed, if we are going to study the subject at all thoroughly, we must recognize many subdivisions. Since we can not go into the details here, let me briefly summarize what appear to me to be the views of leading physiologists of the world. What do the authorities say in answer to the question, is alcohol food? Of course the answer depends first of all on the definition of food. But people may properly differ as to the definition, and it is not worth while to quibble about what may be left to the dictionaries. Let us then go back of this and ask, What do the specialists say as to its nutritive effect?

If we study the views held by the physiologists and pharmacologists in this country and in Europe, who are regarded by their fellow specialists as best qualified to speak with authority, we may perhaps divide them in three groups. At one extreme would be a small group who take grounds, more or less strongly, against any dietetic use or value of alcohol, but even this group would generally admit, I think, the absence of proof that alcohol does not supply the body with nutriment. There is a second group who are inclined to favor the moderate dietetic use of alcohol, tending to class it with nonproteid food materials, like sugar, starch and fat, but still maintaining that its classification as a food is not clearly established. And where they are inclined to question its value for directly supplying the body with nourishment, they maintain that it may be valuable as an aid to digestion and otherwise and find in this another reason for using it as part of the diet. A third group, whether they advocate or oppose its use, regard the evidence as sufficient to pronounce alcohol, in moderate quantities, a food in the sense that it may serve for nutriment, and many urge that there are circumstances in which its nutritive value is very important. Whether alcohol is or is not a poison, is likewise a question of definition. Here again wise men may disagree; but back of this lies the important question, is it injurious? That alcohol may be injurious, that in large enough doses it is unquestionably a poison, and that in smaller quantities, taken habitually, it may be extremely harmful, there is no shadow of doubt. On this point there is no disagreement of authorities. But whether, or under what circumstances, it is injurious when taken in moderate quantities is a very different matter; and here opinions disagree.

The opinion of Prof. Fick, that alcohol in small amounts should be called poison, has been often quoted and is, I believe, made the principal basis of the statement in many of our school textbooks that alcohol is called a poison by the highest scientific authorities. But Prof. Fick defines poison in a way which, be it right or wrong, gives to the word a meaning quite different from that in which it is popularly used. He is one of the group of physiologists who practically deny any food value to alcohol. So far as I am aware, however, their number is small, and it is, I think, being reduced as the result of late research.

I have looked into many of the standard treatises on the subject and have conversed with many eminent physiologists, pharmacologists and chemists about it. In so doing, I have rarely seen or heard alcohol in small quantities called a poison, in the ordinary sense of the word, by any specialist who is generally regarded as an authority. Indeed, as I write this, I do not recall a single instance, but I should not feel warranted in saying that there are no such instances because they are things which one might forget, and furthermore, there may be many which I have not happened to see. I have no doubt that, if I had been looking specially for evidence on this side of the question, I might have found a good deal more than what I have just said implies.

To bring the various uses of food out more clearly, let me remind you that our foods contain different classes of nutritive materials or nutrients. One of these classes includes the nitrogenous substances, protein compounds or proteids, as chemists call them. The myosin which is the basis of lean meat, the albumen or white of egg, the casein which makes the curd of milk, the gluten of wheat, are familiar examples of proteid compounds. They are transformed into blood, muscle, bone and brain. They are the true tissue formers of the body, the materials which serve for building the bodily machine and keeping it in repair. They also serve the body for fuel, but their use in this respect is limited. The fats, like fat of meat, the butter fat of milk, and the oil of cotton or of olive, make a second, and the carbohydrates, which include the starches and the sugars, a third class of nutrients of food. The fats and carbohydrates lack the chemical element, nitrogen, which is characteristic of the protein compounds, but they contain large proportions of carbon and are sometimes called the carbonaceous nutrients. By their oxidation, i. e. burning, in the body they yield its principal supply of energy.

Bread, meat, milk and the like contain both the nitrogenous and the carbonaceous materials. Meat lacks the carbohydrates; to make a well rounded diet, we use bread, potatoes and other vegetable materials with the meat. Bread and milk may be called complete foods, as they contain all three of these classes and with them the other ingredients necessary for nutrition. Such complete foods not only build the bodily machine and keep it in repair, but also supply it with fuel.

While proteids serve for building tissue and have a limited value for fuel, we could not well live on proteids alone. They are not complete foods. Fat, starch and sugars are not complete foods. They can not build tissue; nevertheless, they make the larger part of our food, for the reason that our bodies need more material for fuel than they do for building and repair.

Alcohol can not build tissue, it has no nitrogen. It can not be stored in the body for future use as is the case with fats, nor can it be transformed into fat and thus stored in the body as is the case with the sugars and starches. But it is oxidized in the body and does yield energy. In this respect it is analogous to the fats, sugars and starches. Just how it compares in fuel value with the fats, sugars and starches, or just how these compare with one another in fuel value are questions as yet unanswered.

Alcohol is, then, at best a partial food. To call it food, in the popular sense of the word, and without qualification, may produce a wrong impression. Furthermore, its action on the nerves and otherwise in the body, is such that only very small quantities can be taken without serious derangement. When taken habitually in excess, it is not only injurious to health but ruinous to character. And, while its nutritive action may be very important in some cases, specially with aged people or in certain forms of disease, people generally do not take it for the sake of its nutritive value at all.

Taking the word poison in the sense in which it is commonly understood, namely, as applying to substances which are deadly in their effect, alcohol in small quantities can not in my judgment properly be called a poison. It may be injurious in one case and not in another. Just where to draw the line between the quantity which may serve only as food and that which acts as poison is impossible. The amount that can be taken without injurious effect differs with different people. And, even though there are conditions in which it is not injurious and is even useful, yet there is the danger that it may lead to excess, a danger which, as teachers of youth, we must not, we dare not forget. This fact, coupled with the demoralization that comes with its habitual and excessive use, constitutes, in my judgment, the chief argument against its use.

But I have started to give you the opinions of leading physiologists and have indiscreetly gone out of the way to give you my own, and that, too, when I am only a physiologic chemist. Let us go back to the authorities. At the meeting of the International Physiological Congress, held in Cambridge, England, in September 1898, an effort was made to obtain an expression of opinion which might be taken as a consensus of leading physiologists regarding this special subject. The occasion had brought together some of the best known authorities from the different countries of Europe, America and even Africa and Asia. The congress did not include a great number of men, but it did include a number of great men. The following statement which was drawn up by Prof. Michael Foster of the University of Cambridge, who was the president of the congress, was printed and offered for signature.

> The physiological effects of alcohol, taken in a diluted form, in small doses, as indicated by the popular phrase "moderate use of alcohol", in spite of the continued study of past years, have not as yet been clearly and completely made out. Very much remains to be done, but, thus far, the results of careful experiments show that alcohol, so taken, is oxidized within the body and so supplies energy like common articles of food, and that it is physiologically incorrect to designate it as a poison, that is, a substance which can only do harm and never good to the body. Briefly, none of the exact results hitherto gained can be appealed to as contradicting, from a purely physiological point of view, the conclusions which some persons have drawn from their daily common experience that alcohol so used may be beneficial to their health.

I was present at the meeting and conversed with a number of the gentlemen present regarding the statement. Only a very few, so far as I heard, had any hesitation with regard to it. I learned of two or three who were unwilling to sign it without slight changes in the phraseology. I was told of one who said he believed it, but did not like to sign it, because it might be employed by liquor-sellers as an encouragement to their trade. There may have been a considerable number who disagreed with the statement in one way or another, but, if the number had been at all large, I think I should have known it. Certain it is that a very considerable number of the most celebrated men present expressed their decided approval in personal conversation. I have here a list of 62 men who expressed their approval by their signatures. Nearly all are well known investigators. Among them are professors, teachers and heads of laboratories of a large number of the most noted universities and medical schools of the world. The list includes many of the most celebrated physiologists of our time.

The following, also by Prof. Foster, is interesting, not only as a concise summary of what is definitely known about the physiologic action of alcohol, but also as showing how much space should, in the judgment of one of the most reputable of modern physiologists, be devoted to the subject in an elementary textbook. It fills two of the 247 pages of the *Elementary Physiology* of Foster & Shore.

Alcoholic beverages. Ordinary alcohol is an organic compound of the composition of C_2H_6O. It occurs in the following proportions in the following beverages:

Beer	about	5	per cent
Light wines (claret, hock)	"	10 to 15	"
Strong wines (sherry, port)	"	20	"
Spirits	"	30 to 70	"

When alcohol is taken into the body, most of it is oxidized and gives rise to energy. The amount of energy thus supplied, compared with that of the other parts of the food, is insignificant, and the effect of alcohol depends not on the energy which it supplies, but on the influence it exerts on the changes going on in the several tissues. The value of the various articles of diet does not depend by any means solely on their ability to supply energy; we have seen, for instance, that salts which supply no energy are nevertheless of use in directing the changes going on in the body. In a somewhat similar way alcohol and other substances may influence and direct these changes. Whether that influence is beneficial or no will depend upon many circumstances, and certainly upon the quantity taken. We have many illustrations that a substance taken into the body in a certain quantity will produce one effect, and in another quantity it may be quite an opposite effect. There is no doubt that a certain quantity of alcohol is injurious and interferes with all the functions, and ultimately brings about various diseases, but it does not follow from this that in a smaller quantity it may not be harmless or even beneficial.

Alcohol produces its most marked effects on the vascular and nervous systems. It leads to a dilation of the small blood vessels of the skin, and so to a larger flow of blood to the surface of the body; this, while it produces a sensation of warmth, leads to an increased loss of heat by radiation and perspiration. If the amount of alcohol taken is excessive, the loss of heat will lead to a definite fall of temperature. Alcohol is then of no service as a preventative against cold.

Alcohol makes the heart beat more quickly and makes it do more work in a given time. In some cases this may be beneficial, but generally it is a wasteful and useless expenditure of energy. Alcohol diminishes the power of doing prolonged muscular work, and large quantities lead to a great diminution in the force of muscular contractions.

The effect of alcohol on digestion is very complex. When taken with food it leads to a diminution in the rate and completeness of digestion, if it is present in any but very small quantities. If some proteid (white of egg or fibrin) is put in a flask with some gastric juice, it is found that if a very little alcohol (1 part to 500 of the mixture) be added, the digestion will go on a trifle more rapidly, but if the alcohol added much exceeds the amount, a well marked retardation is produced. It does not follow that such a small amount of alcohol is useful in ordinary digestion, because when it is taken into the stomach we have to consider the influence it has on the secretion of gastric juice, on the movements of the stomach, and on absorption. A small quantity of alcohol appears, however, to encourage the secretion of gastric juice, but large quantities act injuriously on all the processes of digestion.

A small amount of alcohol may promote the action of the central nervous system, and often appears to quicken the rapidity of thought and to excite the imagination, but more usually, and always when taken in any but small quantities, it diminishes the power of connected thought and judgment. It also diminishes the power of receiving sensory impressions, and at the same time blunts all the special senses. Since it reduces the sensibility to cold and fatigue and allays mental pain and worry, it is often resorted to, and then with great danger.

The limit up to which any beneficial effects are produced by alcohol is soon reached, and beyond that it only does harm. This limit is not the same for all individuals; a quantity good for one may be injurious for another, and a large number of people find that strictly moderate quantities of alcoholic beverages do them no harm, while others find that similar amounts impede them in their daily work.

The effect of alcoholic beverages does not depend solely on the ordinary alcohol in them, for other substances which they contain often have powerful actions in the body. The habitual use of such beverages to excess greatly shortens life by inducing diseases of many organs. In some cases of disease alcohol may be of great service, but in health it can not be considered a necessity, and is far more potent for evil than for good.

From the evidence at hand regarding the use of alcohol, the following, by Dr E. A. Parkes, the eminent English hygienist, seems to me a fair and judicious statement of the facts, though I should be inclined to lay a little more stress on the principle that, in health at any rate, it is superfluous or worse, and to insist more strongly on the importance, in this country specially, of general abstinence from its use.

The facts now stated make it difficult to avoid the conclusion that the dietetic value of alcohol has been much overrated. It does not appear to me possible at present to condemn alcohol altogether as an article of diet in health; or to prove that it is invariably hurtful, as some have attempted to do. It produces effects which are often useful in disease and sometimes desirable in health; but in health it is certainly not a necessity, and many persons are much better without it. As now used by mankind, it is infinitely more powerful for evil than for good; and, though it can hardly be imagined that its dietetic use will cease in our time, yet a clearer view of its effects must surely lead to a lessening of the excessive use which now prevails.

During the past 25 years I have been interested in this subject and have taken pains to read about it and to talk about it with many men who are recognized as the leading authorities in this country and in Europe. If I wished, I could easily select statements from a limited number of men that would conflict with the opinions thus expressed. But, if I try to get the consensus of opinions of the men who do the most of the experimenting and the observing, the men who have that habit of mind which is called scientific, the men who are considered by their fellow specialists the most reliable and the most authoritative, I hardly know how to express it better than in the language I have just read to you from Foster and from Parkes.

Reference has been made in the public prints to some experiments under my own direction at Wesleyan University which have had for their object the study of the nutritive action of alcohol. One does not like to say a great deal about one's own work, and I should rather stop with the references to what other investigators have done and said; but in view of the misstatements and misunderstandings which have received currency regarding these inquiries and the conclusions we have derived from them, it is perhaps fitting that I should refer to them now, as I have been specially requested to do.

The experiments in question have been undertaken in behalf of the Committee of 50 for the Investigation of the Liquor Problem, a body of gentlemen who have devoted themselves to inquiry regarding the action of alcohol. The committee is made up of business men, jurists, economists, sociologists, educators and divines, including some of the most prominent men in the country in their several callings. The committee have divided themselves up into subcommittees, and one of these subcommittees is that on physiology. The physiologic work has been divided among the individual members, and it happens that to myself was allotted the subject of the nutritive action of alcohol. The expense of the different inquiries has been borne mainly by private contribution, though sums have been received from certain trust funds devoted to scientific inquiries.

The experiments under my own direction have been materially facilitated by the use of laboratory privileges in Wesleyan University. They were carried out in connection with a series of researches on nutrition which are made under the auspices of the United States Department of Agriculture and constitute part of the larger inquiry into the economy of food, which is under my charge.[1]

The experiments are made by the use of the respiration calorimeter, by means of which it is possible to measure the income and outgo of the body of a man, as expressed in terms of both matter and energy. The apparatus includes a chamber about 7 feet long, 4 feet wide and 6½ feet high, in which the man stays for a number of days and nights. It is furnished with folding bed, table and chair. For some of the experiments, those in which muscular work is to be done, there is provided a stationary bicycle, on which the man may ride the equivalent of a desired number of miles per day. Arrangements are provided for ventilation by a current of carefully purified air. The temperature is kept constantly at a degree which is agreeable to the occupant. In this chamber, he reads, writes, eats, drinks and sleeps. So far from being uncomfortable, each of the five gentlemen who have been subjects of the experiments thus far has found himself very little discommoded in any way save for the monotony of confinement in so small a space. The period of each experiment generally varies from four to nine days, though in one case it reached 12 days. Even after this experience not one of the gentlemen has been in the least unwilling to repeat the trial. So far from finding difficulty in securing subjects, we have numerous volunteers and are able to select men of special fitness for the purpose as regards both bodily characteristics and, where desired, scientific training.

---

[1] The results are given in detail in a memoir of the National Academy of Sciences, which is printed at the government printing office in Washington, and may be obtained by application to the secretary of the National Academy of Sciences, Washington D. C., or to members of Congress. A shorter account will be included in a report of the Committee of 50 on the physiological action of alcohol, soon to be published by Houghton, Mifflin & Co., Boston.

The special object of the experiments with alcohol was to study its nutritive effect as compared with that of the fuel ingredients, fat, sugar and starch, carbonaceous compounds, let us call them, of ordinary food. In most of the experiments pure (ethyl) alcohol was used, though in some the alcohol was given in the form of whisky or brandy. It was administered with water or coffee and taken with an ordinary diet of meat, bread, butter, milk, sugar, and the like. The amount of alcohol per day has been equal to about 2½ ounces of absolute alcohol—about as much as would be contained in three or four average glasses of whisky or in a bottle of claret or Rhine wine. This is generally divided in six doses, three with meals and three between meals, the object being to avoid any marked influence of the alcohol on the nerves and thus to test its action as food under normal bodily conditions. Comparative tests were made by use of rations with and without alcohol. The ration without alcohol consisted in each case of ordinary food materials supplying the nutritive ingredients in amounts more or less nearly sufficient to meet the wants of the body. In the corresponding ration with alcohol, part of the sugar, starch, and fat of the food, the carbonaceous ingredients which supply the body with fuel for warmth and work, was taken out, enough to be equivalent in potential energy to the two and one half ounces of alcohol, and the latter was used in their place. In the experiments in which the man did not work, this alcohol made about one fifth of the total material in the diet. In the experiments with hard muscular work, in which more food was used, the alcohol furnished about one seventh of the fuel supply. 13 experiments in which alcohol was used are now completed, and the results ready for publication. These are compared with a somewhat larger number of experiments similar in the main except that they were without alcohol.

The results will be best understood if we consider that alcohol is compared with the ordinary fuel ingredients of food—the fats, sugars and starches. These serve the body in several different ways. (1) They are oxidized in the body. (2) In the oxidaion their potential or latent energy becomes kinetic or active. 3) Part of this energy takes the form of heat, which keeps the ody warm. (4) Part takes the form of muscular energy, with which the muscular work of the body is done. (5) In being xidized the fats and carbohydrates of the food protect the fats f the body and of other foods from oxidation. (6) In like manner they protect protein from consumption. The question then is, Does alcohol serve the body as fuel in these several ways? We shall see later that the answer is in the affirmative.

Before going into the details, however, we may note certain differences between alcohol and the fats and carbohydrates. Some of these are the following. (7) The ordinary nutrients of food have to be digested. This is done by the action of ferments in the alimentary canal. Alcohol, on the other hand, requires no digestion; it is itself a product of fermentation, it is a predigested food. (8) The ordinary nutrients of food may be and commonly are stored in the body and kept for future use; alcohol can remain in the body but a short time without being oxidized. (9) Alcohol has various effects on the nervous system which are not exercised by ordinary food.

In considering the results of the experiments at Middletown we shall do well to take into account the outcome of other inquiry and thus arrive at conclusions of more general value.

In the very interesting report which was made by your committee and which voices the sentiment of a large number of excellent people to whom the questions were presented, I believe one of the questions was somthing like this: " Should the experiments of Prof. Atwater on the effects of alcohol be included in the instruction?" I understand that a minority answered in the affirmative. If I might be permitted to express my own view, it would be with the majority; I do not think that any particular set of experiments are worth putting into such instruction when there is so much of great importance in the way of conclusion.

What should and should not be taught about this subject in the schools

Will you permit me to state some of the things which, as it seems to me, ought and ought not to be taught in the public schools? In so doing I do not attempt to cover the whole ground or enter into the physiologic details, but simply indicate what, in my personal view, should be said or not said about some of the more important phases of the subject. Of the forms of its physiologic action I select two, its action as food and as poison.

What we should not teach about alcohol

1 We should not teach that it is a food in the sense in which that word is ordinarily used. If we are going to discuss its physiologic action at all, we can not well ignore its nutritive value, but we should at the same time emphasize its limitations. When we speak of it as food or nutriment we should explain to what extent and in what ways it can and can not nourish the body. So likewise, if we speak of its effect on digestion, we should not say simply that it is an aid or that it is a hindrance, but that it may be one or the other or both according to circumstances.

2 We should not teach that it is a poison in the sense in which that word is ordinarily used. We may say with truth that alcohol in large quantities is poisonous, that in large enough doses it is fatal, and that smaller quantities taken day after day will ruin body and mind. But it is wrong to teach our boys that alcohol in small quantities, or in dilute forms in which it occurs in such beverages as wine and beer, is a poison in the ordinary sense of the word. In all that we say on this subject we must bear in mind that the intelligent boy knows well, and as a man he will know better, that people have always been accustomed to moderate drinking as it is commonly called and yet live in excellent health to good old age. If we tell him that alcohol in small quantities is poisonous in the sense in which he understands the word, he will see that we are exaggerating, that we are teaching for effect, and he will instinctively rebel against the teaching.

We may say, and say truthfully, that the moderate use of alcohol is fraught with danger. But the cases where the occasional glass leads to marked excess are the exceptions. If we present them to the thoughtful boy as the rule or the common result, he will detect the fallacy and distrust the whole doctrine.

We may be right in saying that alcohol often does harm to health when people do not realize it, that it prepares the system for inroads of disease, that there is a gradation of injury from forms scarcely perceptible to the utter ruin of body and soul. But to present the "horrible examples" as a common result of drinking is illogical in itself, contrary to right temperance doctrine and hence injurious to the children whom we teach. For that matter I believe that the picturing of the frightful results of vice to young and innocent children is more harmful than useful.

3 We ought not to teach that alcohol in small quantities is harmless. Still more should we avoid saying that it is commonly beneficial. Some of us as individuals may believe that its use in small quantities is generally desirable, but there is nothing in either the facts of common experience or in the results of scientific inquiry to justify the inference as a general principle. Doubtless many people, specially those in advanced age, or suffering under certain forms of disease, are benefited by alcoholic beverages in moderate amounts. Here it may have a decided medicinal value, and my own belief coincides with that of a great body of physiologists in ascribing to it under some such circumstances an extremely important food value, though the exact ways in which it is useful are not yet demonstrated. But I can see no justification for the claim that moderate drinking is generally useful, and there is no denying the terrible fact that it is often harmful, not only in itself, but because of the excess to which it so often leads.

4 We ought not to teach that alcohol in small quantities is always or necessarily harmful. Some of us as individuals may believe this. Honestly believing that theory, we may be justified in arguing for it. But we are not justified in teaching it

dogmatically, and in my judgment, it is positively wrong to make such a dogma a part of the instruction which is presented to our youth as authoritative, be it in the school, the Sunday school or the pulpit. It is wrong for two reasons: first, because it presents an unproved theory as an attested fact; and second, because it leads the trusting child to believe what the thoughtful, and at times skeptical, boy or girl, and the intelligent man or woman may afterward learn to be wrong.

5 Still worse is it to take the theory that the use of alcohol in small quantities is always or necessarily injurious, and set it up as demonstrated by scientific observation and experiment. This is positive untruth. If we tell it to children, they will believe it till they learn better. They may possibly remain in ignorance of the error till they are grown or indeed all their lives. But sooner or later many of them will find that they were deceived; it may be in the high school, it may be in the college or medical school; it may be from general reading or conversation; but, when the deception is found out, a reaction comes. The good we tried to do is undone. The certain injury is far greater than the hoped for good.

To take the theory that alcohol is in no sense a food but always a poison, that it is never useful but always harmful, and allege that it is supported by the great bulk of scientific authority, is falsehood. We may look over the literature of the subject and cull out statements which can be used to support it. We may even find writers of more or less repute who attempt to defend it in the light of scientific experiment. In this way we may accumulate statements which the unsuspecting reader may be led to regard as proving that the scientific authority is on this side of the discussion. We may unconsciously go further and persuade ourselves that there is scientific ground for adopting such theories; so often and so truly is "the wish the father to the thought." In our great anxiety to find every means to work against the evil wrought by alcohol we may gradually come to feel ourselves justified in presenting all the arguments we can against it and in ignoring all we can on the other side. But this does not turn theory into fact or falsehood or misrepresentation into truth.

Your committee have cited from so called "approved" textbooks of physiology commonly used in our schools. The following quotations are of the same order:[1]

> Alcoholic drinks greatly hinder the work of the stomach. They cause the pepsin in the gastric juice to precipitate or sink to the bottom instead of remaining dissolved as it ought in this important digestive fluid. The gastric juice, thus deprived of its pepsin, loses its power to dissolve the food, which therefore has to lie in the stomach until the glands can throw in enough new juice to destroy it. *Eclectic*, no. 2. p. 55.
>
> Alcohol is universally ranked among poisons by physiologists, chemists, physicians, toxicologists, and all who have experimented, studied and written upon the subject, and who, therefore, best understand it.[2]
>
> Alcohol is not a food or drink. Medical writers, without exception, class alcohol as a poison.[3]
>
> It must be remembered that in whatever quantity, or wherever alcohol is found, its nature is the same. It is not only a poison but a narcotic poison.[4]
>
> Beer is a fermented drink made from barley or other grain. . . The alcohol remains in the beer, making it a poisonous liquor. When the grape juice has been squeezed out and its sugar turned to alcohol, it is a poisonous drink.[5]

These statements are misrepresentations. They belong to a kind of doctrine which pervades many of the "approved" textbooks and much of the common temperance instruction. They are none the less false or wrong, either scientifically or morally, because the object is to educate our youth away from evil; the misstatements are none the less reprehensible because they occur in school books which have the official indorsement of a great temperance organization, whose membership includes thousands and thousands of the noblest, the most conscientious, the worthiest, of the women of the world. Nor does it help the matter that such statements are repeated and such theories are promulgated with the sanction, and are enforced by the authority, of the church, in the teachings of the Sunday school and from the sacred desk.

---

[1] See note at end of this paper.
[2] Quoted from Youmans in Blaisdell's no. 2. p. 232.
[3] Eclectic, no. 3. p. 57.
[4] Authorized Series, no. 3. p. 58.
[5] Authorized Physiology Series, no. 2. p. 45 and 49.

Do not misunderstand me. I am not imputing wrong motives, I bring no railing accusation, I charge no one with intended wrong. I only ask that the men and women who do these things—many of them are my acquaintances, some are my warm personal friends, their standing in the community is so high that no arrow of aspersion can reach them, their characters are so pure that no stain can tarnish them, their names are in my memory and their faces in my vision, as I write this—I ask, that they consider the facts as I am sure they have not considered them, that they look into the evidence as I am sure they have not looked into it, and that they remember in their attitude toward these questions the principle I have read in their own writings and heard from their own lips—the foundation of morality is the truth.[1]

What we should teach about alcohol

1 It is, under some circumstances, a valuable nutriment in the sense that it can yield energy to the body but not in the sense that it can build tissue. It is, under other circumstances, a poison in the sense that it is injurious to health. When taken in large enough quantities and for long enough time, it is destructive to life. It is sometimes very useful and sometimes very harmful, but the harm that comes from drinking, in many communities, vastly exceeds the good.

---

[1] A number of years ago, a representative of a large publishing house said to me: "We publish school books. To make our business successful, we must have a good assortment of books. In order to sell the arithmetic and grammar, we must have a physiology also. In order to sell the physiology, it must be 'approved.' To secure the approval we must put a lot of stuff into it which is not true. Generally speaking, we consider it to be our business to make books and sell them, and leave the responsibility for the contents to the authors. But, when it comes to school books, we can not get rid of the responsibility and we can not sell the physiology without doing an amount of lying of which we are heartily ashamed."

We can well appreciate a remark which the author of a popular series of school physiologies made to Prof. Bowditch of the Harvard medical board. When asked how he could justify the unscientific statements, the author replied with warmth, "I have studied physiology, and I do not wish you to suppose that I have fallen so low as to believe all the things I have to put into those books."

I have conversed with not a few publishers and authors of school physiologies, and they all say the same thing. The story is a sad one.

While we can not deny to alcohol a nutritive value, that value is very limited. In yielding energy to the body it resembles sugar, starch and fat, though just how and to what extent it resembles them experimental inquiry has not yet told us. It differs from them in that it does not require digestion and is hence believed to be more easily and immediately available to the body. It is not stored in the body for future use like the nutrients of ordinary food materials. The quantity that may be advantageously used is small. If large amounts are taken its influence on the nerves and brain are such as to counteract its nutritive effect and it becomes injurious in various ways. And finally there are many people who begin by moderate use and are led to disastrous excess.

Alcohol may be useful to one man and harmful to another. One may take considerable without apparent harm, while another may be injured by very little. One may use it habitually without injury, while another may not. In sickness it may be a priceless boon. But it may likewise be the cause of physical, mental, and moral ruin.

2 The boy or the man, as long as he is in good health and does not need alcohol for medicine, is in general better off without it.

3 While some can drink a little without danger of drinking to great excess, others can not. The safest way is to keep out of danger.

4 There are business considerations, also, as well as those of health that strongly favor temperance. The boy who wants to make his way on a railroad or in a large business establishment, has a better chance to get employment and to work up into a profitable position if he is an abstainer than if he is a drinker. Already many such establishments refuse to employ men who drink and there is reason to expect that more will do so.

5 Temperance is always advisable. This we may emphasize most strongly. But whether or not we shall teach the necessity or even the advisability of abstinence is another matter. About this the best men differ. Two who disagree may be

equally honest. Each has the right to express his own convictions and may often feel it his duty to do so. But it is neither just nor wise to teach our youth that the doctrine of total abstinence rests on undisputed principles of either physiology or morals. It seems to me that the question whether a man should be a total abstainer depends on two considerations. The first is one of policy. Will drinking injure him? If so, he had better abstain; if not, he may drink. But he should be sure of his ground before he begins, and he had better wait till he reaches maturity and understands himself and the subject well, before he takes the risk. The other consideration is an ethical one. Paul's doctrine of refraining from that which will cause others to offend is a rational and forceful appeal to conscience. Remembering that a man does not live for himself alone, what will be the effect of his example and what is his duty? The rule of conduct in this respect, is a matter for him to decide. You and I may have the right to advise him, but the decision is between himself and his own conscience.

6 An ambitious and right-minded boy wants to be an influential and useful man. I think he should be taught that it would be better for the community at large if there were less drinking; that the community are influenced by the examples of strong and good men; and that his own personal influence will be better if it is on the side of temperance.

7 Great as is the danger of alcohol to purse and health, the moral injury is incomparably worse. Its most terrible effect is its demoralization of character. However much good men may do in helping others to save their money and promote their health, a still greater service to their fellow men is that which helps them to a higher plane of moral living. And here is the strongest argument of all in favor of that self-abnegation which leads us to do those things, and those things only, which will best enable us to render that service to our day and generation. In that way we do our noblest duty to our fellow men and to our God. All this we may and I believe we should teach in the schools.

Errors in the current temperance teaching. Ethical considerations

The misstatements in the textbooks of the type referred to above are of various kinds. Sometimes the error consists in stating doubtful theories as attested facts; in other cases, the principles laid down are partly true and partly false; in still others, the statements are squarely opposed to the results of all of the latest and most accurate scientific research. The statements are enforced by quotations, of which some are by real authorities but are too often put in such ways as to misrepresent their actual teachings, while others are from men who do not stand for the best research and the highest scholarship but are quoted as the most reliable authorities.

I do not mean that the approved textbooks are all wrong. A great deal of what they say is entirely true. In the parts not bearing on the action of alcohol there is often little to criticize and much to commend. The trouble is this admixture of error.

In one respect they are all alike. The impression which they give the pupil is that science teaches that alcohol, even in moderate quantities, is always harmful.and never useful. This is untrue.

The object is to oppose an enormous evil, to teach our youth to resist that evil. The purpose is most worthy; the trouble is in the method. The evil being clearly defined, a doctrine is formed to meet it, and evidence is sought to sustain the doctrine. Whatever can be found in its support is exaggerated. Whatever opposes it is ignored or denied. It gradually ceases to be the propagandism of the few and becomes the creed of the many. It is the old story of human dogma, repeated over and over again in politics, in theology, and in morals. And here, as in many other cases, the worthiness of the cause and the earnestness of the advocates are such as often to "deceive the very elect." Indeed, the very best people often become the most sincere and devoted advocates of the doctrine. In this case, the scientific expert is not deceived. But the statements are put in such persuasive ways and sustained by such seeming force of scientific authority that the unsuspecting pupil, and indeed the teacher who implicitly trusts the textbooks, is led to believe that they represent the real teaching of the best physiological science.[1]

I was once talking about this subject with a teacher and reminded her of Lincoln's saying: "You can fool all the people some of the time, and some of the people all the time, but you can't fool all the people all the time." She replied: "But can't we fool the boys till their characters are formed?" Now I think that lady was perfectly sincere; I am equally sure that she was wrong. You can not build character on falsehood.

A well known philanthropist in New York city tells this story: "I happened to be in a school down on the East side when a class of boys from tenement families were reciting in physiology. The teacher asked, 'What is beer?' The answer came in chorus, 'Beer is poison.' Now those little chaps knew that

---

[1] An honored teacher whom you well know, Samuel T. Dutton, formerly of Brookline Mass., now of New York, in discussing this subject, speaks as follows:

From the point of view of temperance, sound education and good morals, I am sure that this condition of affairs calls for our strong disapproval. We do not teach hygiene by the study of disease, cleanliness by the observation of filth, purity by the contemplation of vice; and to force upon every child 100 lessons or 500 lessons on the effects of alcohol is likely to take away his sensitiveness and to make him morbid or indifferent, if it does not bring about a reaction which leads him to say: "I am going to try it." Children who are taught that wine and tobacco are absolute poisons, and who see their fathers, brothers and friends constantly indulging in these stimulants, can only look with ridicule and contempt on this effort to deceive and frighten them. It is certain that the teachers who have tried conscientiously to give this instruction have often seriously questioned whether they are not justified in evading the requirements of the law in order to avoid the greater evils which were likely to follow the teaching.

I wish to emphasize what seems to me the unwisdom of this kind of teaching for young children, to which Mr Dutton has so aptly referred. It is argued that a great majority of the youth leave school early and the only opportunity to teach them anything about this most important subject is in the lower grades. Since they can be taught but very little, the instruction is confined mainly to one thing, namely, the principle that physiologic science shows that alcohol is always harmful to health. Even if this were true, it seems to me doubtful whether the teaching could have the desired effect, whether the harm that comes from the revealing of evil to children is not greater than the good. But, considering how much untruth there is in the doctrine, must it not in the long run be positively harmful?

that was a lie. Their fathers and mothers drank beer every day. Such children were not fooled by any such teaching."

But even if they are deceived for a time, it will not last, nor can you get around the difficulty by falling back on definitions. Tell a boy a thing is poison, and he will suppose that you mean by poison what he means by it, and what people generally mean by it. He has not access to the particular dictionary or scientific treatise which has a definition that may be stretched to fit your meaning. You may persuade him for a time that it is a poison in the popular sense of the word, but, when he grows up, he will learn that he was mistaught; indeed, he may do so before he is grown up. Scholars in the higher classes share the present tendency to skepticism; when the pupil finds that he was deceived, he does not mince matters, he reasons with himself, "That teacher and that textbook lied. If they would lie in one case, they would in another, and I am not going to believe anything they told me." Even if he does not go so far as this, even if his faith is not lost but is only shaken, the harm is done; the effect is to undo much of the good that the teaching is intended to do. Furthermore, and what is still worse, the result must be to impress on the pupil, and by the most effective agency, that of example, the example of the school, the Sunday school and even the pulpit, the idea that deception is allowable in a good cause, that the end justifies the means. This is undermining the very foundations of morality.

One of the most honored school superintendents in the United States remarked to me in speaking of this subject: "Teach the boy of 10 that a lie is the truth, and at 20 he is in danger of believing the truth is a lie."

This evil, so intrenched behind the earnest aspirations of our community, and so fortified by legislation, is the one against which I protest and which I urge you, as leaders in education, to unite in your endeavors to oppose.

Perhaps I ought to speak more considerately of things so dear to thousands of the best, the most earnest, the most devoted people, those to whom temperance means so much, who would shrink with horror from intentional deceit and in the fiber of whose noblest thought this doctrine is so interwoven. We meet here a very peculiar difficulty. The object of this teaching is a noble one. When we criticize the method, we are in danger of seeming to oppose the purpose, and yet the improvement in method is necessary for the attainment of that purpose. It seems to me that one of the great obstacles in the way of the true temperance reform is found in this very exaggeration which makes so large a part of the means used to promote that reform. It is building on the sand. The place to build is on the rock of attested truth.

You see then, that I am not trying to set up a dogma in opposition to "scientific temperance instruction." I earnestly approve of the purpose but object to part of the method. I protest against the dogmatic teaching of scientific theories which still lack demonstrative proof. More than that, I protest against the teaching of what science shows to be positively erroneous. And I also ask that the teaching of science in our schools shall keep pace with the progress of research.

But what are we to do about it? I hesitate to make positive suggestions to those who have much more experience than I and on whom rests so much of grave responsibility for deciding what instruction our youth shall receive. I venture, however, these considerations.

The success of such instruction depends very largely on its spirit. If it is based on the real desire for truth, if disputed principles are referred to as questions rather than demonstrated facts, if no more is claimed than is proved, and if, under these restrictions, the evils of alcohol are clearly set forth, and specially if the teacher speaks with the power of accurate knowledge and profound conviction, the instruction can not fail to be incalculably useful.

Still more effective will it be, in my judgment, if less stress is laid on the material, i. e., the physiologic and economic side of the question, and more on its moral aspects. Our people are keenly alive to ethical ideas. And youth is a time when thought is fresh, the aspiration is for the ideal, and mind and heart are open to the truest ethical impulses. Let me emphasize most strongly the moral aspects of this question. Temperance reform is moral reform. I can not see how a thoughtful man, earnestly desirous of rendering his best service to the community, can fail to be interested in that reform. The harm which alcohol does to health, the economic injury it brings to the individual and to the community are terrible enough, but it seems to me that the supreme evil which comes from its misuse is its effect on character, its power of demoralization, the moral ruin which it brings. No exaggeration is needed to paint this picture in the most terrible colors. As one who has been interested in temperance reform from childhood, I have come to believe that we have been depending too much on the economic and physiologic argument. Statistics of the nation's liquor bill do not appeal very strongly to the ordinary man, still less does the average boy care for them. The men who know most about the physiologic effects of alcohol are specialists in physiology and hygiene. I know scores of these men. Total abstainers among them are exceptions, I was about to say, rare exceptions. The same, we all know, is true of practising physicians. If they are not persuaded by the facts they know so well in both theory and practice, what can we expect from teaching the average boy or girl a little of the theory?

The supreme object of education is the formation of character. Character is shaped by education, but its basis is morality. Again I say, temperance reform is moral reform. The mind and heart of youth are most strongly influenced by mortal thoughts, by ethical ideals. There you can keep within the truth and there make the strongest appeals.

I am speaking to you as teachers, about a principle of pedagogics. Will it seem inappropriate if I refer to the example of the greatest of all teachers. One whose doctrine is so profoundly wise that its wisdom is the more highly appreciated as the individual and the race constantly increase in knowledge and experience? The foundation of His whole doctrine was simple truth. He appealed always and solely to what is best in us; least to the lower and more material considerations and most to the higher ethical aspirations. Above all things, He avoided the basing of rules for conduct on material arguments about which there could be any special doubt. That teaching is understood by the child, its power over him grows with his growth, it becomes a controlling force in his life. I do not say that material arguments can not be effective, nor do I wish to minimize their usefulness. What I do urge is that they can not be useful at all unless they are so true as to be beyond question, and that, at best, they do not constitute the most effective appeal. Tell the child that the reason why he should not drink is because alcohol is always poisonous, enlarge on the harm it does to health, and you may produce a strong impression, but the danger is that it will not be lasting. The seed falls where there is not depth of earth; and, with the on-coming of mature knowledge and the understanding that the principle is wrong, it withers away. Plant where there is depth of earth, where the roots will strike down into the depths of moral conviction, and it will bear fruit many fold.

Those things are most influential and useful in education which draw out what is best in the learner, which cultivate the germs of conviction and aspiration in his own soul, so that they grow up into purpose, character and influence. What we say, the child forgets. The rules are written on the memory, but time effaces them. The things which remain are the impressions which sink down, become a part of feeling and judgment and then grow up again into permanent character. The impressions that are lasting and useful are the ones that accord with the deepest and truest convictions, and the ones that the experience of age can verify. These are what develop the power within us that makes for righteousness.

One essential for the success of true temperance reform is that what is taught as science shall be placed on the basis of demonstrated fact. This means a change of base on the part of a great body of our most earnest temperance reformers; but that change is necessary. We wish to help the drunkard to reform; but is it necessary to tell him that no man can touch alcohol without danger? To build up the public sentiment on which the reform of the future must depend, we wish our children to understand about alcohol and its terrible effects; but, when we teach them in the name of science, shall we not teach them the simple facts which science attests and which they can hereafter believe, rather than exaggerated theories, whose errors, when they learn them, will tend to undo the good we strive to do? In short, is not temperance advisable even in the teaching of temperance doctrine?

In the great effort to make man better, there is one thing that we must always seek, one thing we need never fear—the truth.

Conclusion as to alcohol physiology in the schools and legislation requiring it

To come back to the original question: my own answer will be somewhat like this.

The amount of time and space that should be given to the physiologic action of alcohol in our school books and schools should be limited. I should say that a small number of pages, enough to correspond to only a very few daily lessons, would be ample, and that this should be taught only in the higher and not in the lower grades.

The kind of instruction should be that which is scientifically correct. Above all it should be based on plain, well attested, impartial, unexaggerated fact. The chief argument against the use of alcohol should rest on the ethical rather than on the physiologic or economic basis.

The legislation which requires this instruction should be general rather than specific. Both the kind and the amount of instruction should be left to the great body of capable, conservative, and earnest educators to decide.

The Connecticut school physiology law

Many of you are aware that the Connecticut legislature last winter repealed the somewhat stringent statute regarding the teaching of alcohol physiology in the public schools which has been in force since 1893, and put in its place a law which is much more acceptable to the teachers of the state as well as to educators and men of science generally. If you are not already familiar with the details, you may be interested to know how the movement came about and what is the nature of the new law. In Connecticut, as elsewhere, there has been great dissatisfaction among teachers and others with the requirements of the statute and with the "approved" textbooks which have been practically forced on the schools. At a meeting of our State Council of Education just about a year ago, a paper was presented on this subject. Indeed, I might just as well say frankly that it was very nearly the same as that I have been presenting to you today. It was naturally followed by some rather active discussion. The topic had been announced in advance and several leaders of the temperance organizations of the state were present by invitation. A bill had already been brought before the legislature, providing for a repeal of all requirements for temperance instruction. The feeling of educators was quite strong; some favored the bill doing away with the temperance physiology entirely, but the majority thought it best to retain some features of the instruction. The secretary of the state temperance society, realizing the state of affairs, suggested that the school people and the temperance people should get together and endeavor to come to some agreement, and, if it seemed best, ask for modifications of the statute then in force. The suggestion was accepted and a committee of principals and superintendents was appointed for the purpose. The outcome was that the temperance organizations, including the state branch of the Woman's Christian Temperance Union, gave their assent to a bill proposed by the teachers' committee and agreed to support it before the legislature. The bill was introduced in the legislature and warmly urged. Some of the teachers, indeed, felt that it would be better to do away with all legal requirements for temperance instruction, but they withheld opposition as did many of the temperance people, who felt that the new bill surrendered what they had earnestly and conscientiously striven for. A few of the more strongly partizan temperance people in the state objected to it. The strongest opposition, however, and it was at once viligant, systematic and intense, came from the national organization of the Woman's Christian Temperance Union through its department of scientific temperance instruction. On the other hand, the bill was warmly approved by such educators as Pres. Hadley of Yale, Pres. Raymond of Wesleyan and a number of the scientific men of the state. When the bill came to actual vote in the legislature, it passed without a word of opposition.

An incident in the campaign is worthy of mention. It arose from the division in the ranks of the Woman's Christian Temperance Union. The state branch had pledged itself to the support of the bill. The national organization endeavored to induce individual members and organizations in the state to withdraw their support and oppose it. The state president, however, was true to the pledge and was able to influence most of her associates in the state to be true also.

Indeed, it was evident to the temperance people that this was the part of wisdom. They saw the danger that all they had accomplished by way of legislation would be done away with. They had also learned that not even state legislation could be depended on to enforce instruction which was opposed to the reason and conscience of the teachers and the best pedagogic and scientific opinion.

The new law is a compromise. While it does away with much that the temperance people earnestly desired, it still goes further in its requirements than many of the teachers would have wished. But it has the great advantage that it leaves the character and amount of instruction in alcohol physiology to the good judgment of the teacher. It requires that (1) the effects of alcohol and narcotics on health and specially on character shall be taught in connection with hygiene as a regular branch of study to all pupils above the third grade, except in public high schools, that (2) suitable textbooks of physiology and hygiene, which explain the effects of alcohol and narcotics on the human system, shall be used in grades above the fifth, except in public high schools, and that (3) all normal schools and teachers training classes shall give instruction in this subject and in the best methods of teaching it. It does away with the old requirement for teaching it below the fourth grade, because of the belief that little children are better off without it. It does away with the requirement for teaching it in the high schools, on the theory that physiology should be taught there like other branches of science. It leaves the kind and amount of teaching, as well as the kind of textbook and the amount of alcohol physiology it shall contain, to the decision of school boards and teachers, on the supposition that they can best judge what will be most useful to be taught to the children in their charge.

The chairman of the teachers' committee, W. B. Ferguson of Middletown, says very aptly that this is the first instance on record of the temperance people and teachers of any state uniting in the support of a measure of this kind. He adds:

> Too much praise can not be given those broad-minded, sensible, and courageous temperance people of Connecticut who showed an open mindedness, a spirit of conciliation, an invincible loyalty to their agreement under circumstances that would have severely tested the courage and faithfulness of any but those who place duty before policy, honor before favor, and the interests of the children before the pleasure or censure of anybody.
>
> It now remains for the school officials and teachers of the state to live up to the letter and spirit of the law by endeavoring to impress on their children and youth the principles of temperance and of temperate living.

Our act of 1893, which this new one of 1901 replaces, was less stringent, less burdensome to teachers, and, in my judgment, less detrimental to the interests of the schools and of temperance than your present legislation in New York. In our case the change was rendered possible by a discussion in which the public was made aware of the actual nature and tendency of the law and of the instruction it required, and of the attitude of teachers and others regarding it. The conflict between the so called "scientific temperance instruction" and the convictions of educators and men of science was thus made clear. The more conservative temperance leaders met the teachers half way. Thus united, they took counsel with each other and with educational and scientific authorities, agreed on a measure, saw it through the legislature despite the opposition of the more radical elements, and are determined to do their best to make the teaching effective for the purpose for which it is really intended. This seems to me a very happy solution of what otherwise might have been a very serious difficulty.

I venture to inquire whether you may not be able to bring about a similar cooperation of conservative friends of temperance reform in your own state.

[Prof. Atwater referred to a statement quoted by the committee from Steele's *Hygienic Physiology* as an illustration of the teaching that alcohol is not oxidized in the body and, on this account, can not serve for nourishment. He stated that this passage occurs in the latest edition he had been able to obtain from the publishers, one or two years ago, and that it contained an indorsement by the scientific department of the Woman's Christian Temperance Union, certifying that the statements in the book had been carefully revised so as to keep abreast with the latest teachings of science. This statement was, according to his recollection, dated in 1889. As Mrs Hunt, the superintendent of the scientific department referred to, was present, he asked that she would kindly correct his statement if it was in any respect erroneous. Mrs Hunt replied as follows:]

Mrs Mary H. Hunt—*Mr Chairman:* I understand Prof. Atwater to charge that the *Hygienic Physiology* by J. Dorman Steele, was not abreast with the teachings of science on the subject of the oxidation of alcohol in the human body at the time indorsement to it was given.

To this I reply, the facts do not sustain this charge. The book, Steele's *Hygienic Physiology*, was written in 1884, though no formal indorsement was given to it till 1889. At that time, 1889, men of eminence, students of the alcohol question, like Dr N. S. Davis, of Chicago, and Ezra M. Hunt M. D., of Trenton N. J., said that the oxidation of alcohol could not be admitted till the products of such oxidation were found. The latter, Dr Hunt, in his paper on "Alcohol as a Food and Medicine" read at the International Medical Congress at Philadelphia, quoted a then recent edition of Wood's *Materia Medica* which said: "No one has been able to detect in the blood any of the ordinary products of its (alcohol's) oxidation." Consequently the book, in not affirming that alcohol is oxidized in the system, represented a respectable school of medical opinion at the time the indorsement to it was given.

In 1890 Bunge's *Textbook of Physiological Chemistry* appeared, which said: "We know that alcohol is to a very great extent oxidized in the body". "But," he adds, "it does not follow that it is therefore a food." From this it is clear that up to 1890 there was good authority for not teaching that alcohol is oxidized in the body.

In 1897 Dr Koppe, in a paper read at the International Medical Congress at Moscow, said that oxidation did not prove a substance a food, that morphine, as was well known, is oxidized in the body, but no one thinks of calling it therefore a food. Other scientists have said the same thing.

Inasmuch, therefore, as oxidation does not settle the question of the food value of alcohol one way or the other, and inasmuch as the book did not state that alcohol is not oxidized in the body, there was no imperative call for immediate change. Nevertheless, a revision of the book in this and other particulars, delayed somewhat by the fact that the author had died, has been on the market for some time.

Mr Chairman, I submit that it is most unjustifiable to cite the statements of an old edition of a book that was abreast with science at the time it was written and is now revised to date as evidence of the inaccuracy of the teaching for which the temperance education movement is responsible.

[The textbook referred to is Steele's *Hygienic Physiology*, which bears the following indorsement:

> Boston, June 20, 1889
>
> The Pathfinder Series of Textbooks on Anatomy, Physiology and Hygiene consists of the following volumes:
>
> 1 Child's Health Primer (for primary grades)
> 2 Hygiene for Young People;
> or Young People's Physiology (for intermediate classes)
> 3 Hygienic Physiology (for advanced pupils)
>
> The above are the series originally prepared (as their general title indicates) to supply the demand created by the laws for temperance instruction in public schools in the United States. They were written by experts under the supervision of the scientific department of the National Woman's Christian Temperance Union, published by the instigation of the same, and have been carefully revised from time to time, under the same supervision, to keep them abreast with the latest teachings of science.
>
> Being both teachable and well adapted to grade, their educational value, as proven by school room tests, is of the highest order. We therefore cordially indorse and highly recommend the Pathfinder Series for use in schools.
>
> MARY H. HUNT
> National and international superintendent of the scientific dep't of the Woman's Christian Temperance Union; life director of the National Educational Association
>
> *Advisory board*
> Joseph Cook William E. Sheldon
> Albert H. Plumb D. D. Daniel Dorchester D. D.

In the *School Physiology Journal*, edited by Mrs Hunt, several series of approved physiologies have long been advertised. The Pathfinder Series, to which Steele's *Hygienic Physiology* belongs, was placed first in the list of those recommended in the advertisement as late as September 1900. In October 1900 the New Century Series was announced, but the Pathfinder Series was still continued, though it does not appear in the latest numbers of that journal.

The passage referred to by Prof. Atwater was the following from pages 177-79 of the textbook named:

> *Is alcohol a food?* To answer this question, let us make a comparison. If you receive *into your stomach* a piece of bread or beef, nature welcomes

its presence. The juices of the system at once take hold of it, dissolve it, and transform it for the uses of the body. A million tiny fingers (lacteals and veins) reach out to grasp it, work it over, and carry it into the circulation. The blood bears it onward wherever it is needed to mend or to build "the house you live in." Soon, it is no longer bread or beef; it is flesh on your arm; its chemical energy is imparted to you, and it becomes your strength.

If, on the other hand, you take into your stomach a little alcohol, it receives no such welcome. Nature treats it as a poison, and seeks to rid herself of the intruder as soon as possible. The juices of the system will flow from every pore to dilute and weaken it, and to prevent its shriveling up the delicate membranes with which it comes in contact. The veins will take it up and bear it rapidly through the system. Every organ of elimination, all the scavengers of the body—the lungs, the kidneys, the perspiration glands, at once set to work to throw off the enemy. So surely is this the case, that the breath of a person who has drunk only a single glass of the lightest beer will betray the fact.

The alcohol thus eliminated is entirely unchanged. Nature apparently makes no effort to appropriate it. It courses everywhere through the circulation, and into the great organs, with all its properties unmodified.

Alcohol, then, is not, like bread or beef, taken hold of, broken up by the mysterious process of digestion, and used by the body. "It can not therefore be regarded as an aliment", or food. *Flint*

To the above clear statement that the alcohol, instead of being burned in the body, is eliminated without change, is added the following statement in a footnote, which represents the oxidation of alcohol as a disproved theory.

Because of the difficulties of such an experiment, we have not yet been able to account satisfactorily by the excretions for all the alcohol taken into the stomach. This remains as yet one of the unsolved problems of physiological chemistry. To collect the whole of the insensible perspiration, for example, is well-nigh impossible. It was supposed at one time that a part of the alcohol is oxidized—i. e., burned, in the system. But such a process would impart heat, and it is now proved that alcohol cools, instead of warms, the blood. Moreover, the closest analysis fails to detect in the circulation any trace of the products of alcoholic combustion, such as aldehydes and acetic acid. "The fact", says Flint, "that alcohol is always eliminated, even when drunk in minute quantity, and that its elimination continues for a considerable time, gradually diminishing, renders it probable that all that is taken into the body is removed."

[Referring to the above statement Prof. Atwater said:]

The difficulty of collecting the whole of the bodily excreta, *including* the "insensible perspiration" was solved by Pettenkofer and Voit with the respiration apparatus as early as 1862. In 1883 Bodländer measured the alcohol excreted by a dog through the lungs, the skin and the kidneys separately and found that under ordinary circumstances, at least 95% was oxidized in the body.

To recapitulate briefly: The theory that alcohol is not oxidized but is eliminated entirely unchanged was proposed by Lallemand Perrin and Duroy in 1860 on the basis of experiments which were soon afterwards shown to warrant no such conclusion. Other experiments before and after 1860 showed that alcohol is oxidized. No prominent experimenter on the subject since 1870 has claimed anything else. The question was practically closed by 1875, and in 1883, accurate measurements by Bodländer showed that only very small quantities are given off unoxidized. The textbook states clearly that alcohol is eliminated without oxidation and makes this the basis of the claim that it can not serve the body as food. The indorsement in 1889 states that the textbooks of this series were written under the supervision of the scientific department of the Woman's Christian Temperance Union, published by its instigation, and had been "carefully revised from time to time to keep them abreast with the latest teachings of science." In 1900, this series, still bearing the same indorsement, was placed first in the list of the textbooks recommended in advertisements in a journal published by Mrs Hunt.

[Comparison of recent editions of Steele's *Hygienic Physiology* shows that, while a number of changes were made throughout the book in 1897, the revision of pages 177-79 was not made till 1900. *Note by Franklin W. Barrows, president of the association*]

Dr Didama—I have just a few words to say, and it will not take me any great length of time. There has been some discussion about the kind of books which are used in teaching temperance in the schools as the law requires. There have been some objections to the books which have been used, and some new ones, entitled the *New Century Physiologies*, have lately been prepared by Dr Henry F. Hewes, the eminent teacher of physiologic and clinical chemistry in Harvard Medical College, and by Dr Hall, professor of physiology in Northwestern University. I have looked them over with some care within two or three days, and I think I can commend them as being quite free from the faults of the old books. Now whether alcohol is a food, as Prof. Atwater claims to have demonstrated—and I think many will go away from here satisfied that he did demonstrate it—or a poison with little food value, as is claimed by many of the most eminent physiologists, I earnestly protest against teaching children in our schools that alcoholic beverages taken in moderation are beneficial rather than injurious. Moderation is a word of dangerous use. Every criminal convicted of deeds committed when intoxicated, every one who died a drunkard was at one time a moderate drinker. Most of you know that more than $700,000,000 are expended in this country every year for alcoholic beverages, and that another $700,000,000 are required to punish the criminals and support the paupers who were made criminals and paupers by the use of these drinks. Years ago alcohol in the form of beer or whisky was thought to be necessary for laborers in hot weather, and specially in the cold of winter. In harvest time farmers used to lay in a large supply of whisky, because hired men would not work unless they could have their drinks regularly. It was generally believed in those days and is still believed by some people that a drink of whisky is good if exhausted or fatigued and excellent to improve the digestion. You all know the testimony of arctic explorers like Kane and Nansen, that men undergo cold better without alcohol, and Kane never administered any even when the thermometer went down to 80° below zero. Lord Kitchener, who was the commander in chief of the English army in Egypt, declared that his soldiers bore the fatigue of long marches and were better fighters and recovered sooner from exhaustion when they did not have alcoholic drinks, and they never had a drop of grog in all that long campaign. Kitchener knew that the dervishes were the best fighters in the world, and that, being

Mohammedans, they never used intoxicants, for this was forbidden by the Koran. Col. Ray, commandant of Fort Snelling, in Minnesota, informs me that beer-drinkers were the first to fall out in long marches and the most inaccurate marksmen that he had, when he needed good marksmen with these modern guns which carry to a long distance.

I want to ask this question: How many parents would like to have their children taught that alcohol taken in moderation is harmless, when, if it were known that these children used it, they would be excluded from employment in most kinds of business, from being a captain on a steamer, an engineer on a railroad, or any position of trust or responsibility? How many parents would dare to run the risk that their children might become inebriates and criminals from their personal use of this highly commended whisky food?

O. D. Clark—We have with us this afternoon a lady who has been most intimately connected with this movement of reform in the teaching of the effects of alcohol and narcotics; and I am sure we should all be delighted to hear what she has to say, and I think I represent the association in asking that the chairman do not enforce the five minute rule.

Mrs Mary H. Hunt—I agree most heartily with Prof. Atwater that we need not be afraid of truth. But the great question before us is, what is truth? I understand Prof. Atwater to say that the temperance teaching in the public schools is not in accord with the views of specialists and the latest scientific investigations and therefore is not true. In proof of this he cites his own experiments. The impression left on my mind and, I think, on the audience, is that he claims that Dr Rosemann, of Griefswald, sustains his (Prof. Atwater's) deductions from his Middletown experiments to the effect that these experiments proved that alcohol protects the albumen of the body of the drinker and therefore has food value as a beverage.

I, too, have been studying Dr Rosemann's 200 page article in Pflüger's *Archivs für Physiologie.* I regret that Prof. Atwater failed to give Dr Rosemann's conclusions drawn from his experiments, for those conclusions put the whole matter in a very different light from that just presented to us. I happen to have with me a translation of the summing up of the whole matter which Rosemann makes in his paper. He sweeps the beverage use of alcohol aside with these words: "It is generally agreed that alcohol can play no rôle as a nutriment in health. The only question, therefore, is concerning the employment of alcohol as a food with the sick"; and then there are grave doubts, and only experiments can give the final decision.

Dr Rosemann's experiments show that during the first four to six days when alcohol was taken there was a loss of albumen. This Rosemann takes into account in considering the advisability of using it as a food in sickness. He says: "If we were certain that an increased albumen loss would be easily endured by any patient for from four to six days, we might then obtain in alcohol, for the later period, an easily ingested albumen-sparing substance."

But he further says:

> I hold it quite possible that there are entirely healthy men whose cells do not become accustomed to the injurious effects of alcohol upon albumen, or at least only slowly and eventually not in full measure. If, therefore, under normal conditions the albumen-sparing action of alcohol does not always finally take place in the person in health, the result with the sick is to me still more doubtful. In any case, one can not without further evidence take it for granted that the cells of the sick will become accustomed to alcohol at the same rate as those of the well.

Hence, according to Rosemann, no one can foretell in any given case first, whether the body cells of the sick or well will ever become so accustomed to the injurious effects of alcohol that it will cause a sparing of albumen; and second, whether, in the case of the sick, the loss of albumen caused by alcohol during the time the body is trying to get used to it will not kill the patient.

It is a matter of public knowledge that Prof. Atwater announced to the world as one evidence of the food value of alcohol that he had proved that it protects the material of the body from consumption as effectively as corresponding amounts of sugar, starch and fat; but it is likewise known that the published tables of his experiments do not support this conclusion, hence his conclusion has been discredited by the scientific world.

Dr Rosemann reviews the Atwater experiments in the article in question and says distinctly that they did *not* show a protection of protein, but on the contrary a very significant loss. Hence, we are unable to see how this statement of Rosemann accords with the claims made by Prof. Atwater for his experiments.

Furthermore, quantities of alcohol smaller than those given in the experiments to test its food value derange the nervous system to such an extent that the working ability of brain and muscle is diminished; hence from any rational standpoint alcohol can not be considered a food in the sense in which the word food is commonly used, i. e. as a substance whose nature it is to build tissue and furnish energy to the body without injuring any of its parts.

In referring to the report of the science committee, please allow me to disabuse your minds of one fallacy that seems to be afloat. The temperance education laws say, "the nature of alcoholic drinks and other narcotics and their effects upon the human system in connection with the several divisions of physiology and hygiene shall be taught all pupils in all schools," but there is not a line nor a word in the temperance education law of this or any of the other 44 states in this country or in the national law that specifies what shall be taught about alcohol or other narcotics. If this science committee can prove Dr Didama and all the doctors wrong and that alcohol is a food and not a poison, the school books will ultimately so teach, for truth can not be suppressed in this 20th century.

The argument of your committee's report that the oxidation of alcohol in the body proves it a food falls before the fact that other poisons as morphia, etc., are oxidized in the body, producing heat and energy, but that does not make them foods.

It is most fortunate that this committee proposes to continue its study for another year. Over against its quotations from Fothergill, who died 13 years ago, we suggest that they study the 2000 experiments recently performed in the laboratory of Prof. Kraepelin in Heidelberg, and others that show the absurdity of asserting that the nature or character of a substance changes with its quantity. Dr Koppe put this strongly before the International Medical Congress at Moscow, in 1897. He said:

> The chemical nature of a substance can not change with the quantity, and can not be lost in the smallest quantity; but it must in every qualitative analysis remain the same so long as by progressive division this substance as such still exists, even down to the last molecule.

An essential, more than that, a vital truth has been left out of the committee's plea for moderate drinking, namely, the fact nobody can deny that a little alcohol has the power to create an uncontrollable and destructive appetite for more.

The English definition of a poison which Prof. Atwater gave does not fit the case. I know of no other definition of a poison as "a substance that can only do harm and never good to the body." Dr Didama will tell you that he sometimes gives his patients preparations of arsenic for medicinal purposes, that is, to do good to the body, but this does not make arsenic any the less a poison. Poisons are not substances that always do harm and never do good. The definitions of poisons in the school physiologies are in accordance with the definitions of great authorities like Taylor. In his standard book on poisons he says, "A poison is a substance whose nature it is when absorbed into the blood to injure health and destroy life." Education begins with first principles which lead on to larger developments of truth. If you are going to wait till children can understand all about any subject before you teach them anything, you may as well shut up your schools at once.

As to the complaint that there is too much temperance matter in the textbooks: if every detail of the question of the effects of alcohol on the human system were treated, one fifth of the space of the books would not be enough to cover it, but that is not done. The amount of physiology and general hygiene that is needed in each successive grade of the school course is first computed, and then the proportion of temperance matter required for a clear statement of the facts that the pupils should know. From this we get the proportion of four fifths general physiology and hygiene and one fifth temperance matter.

I regret that there is not time to show you that the Connecticut temperance education law which has been recommended to you as a substitute for your admirable statute on this subject is only words, words, sounding brass and tinkling cymbal.

Prof. Bishop—I would like to ask one question for information. You said that certain poisons are oxidized in the body. On what experimental evidence is that statement made?

Mrs Hunt—I can give you the authority of such men as Dr Hall, a graduate of Leipzig, Dr August Forel and Dr Hewes.

Prof. Bishop—I have seen the statements, but I did not find that they were backed by any experimental proof or any evidence whatever.

Mrs Hunt—That can easily be furnished and I will be very happy to furnish it, but I shall have to refer to my library to do it.

Mrs Hunt—[Given later in answer to the above question] Experimental evidence that morphia, a poison, is oxidized in the body will be found in an article by Edwin S. Faust, in *Arch. für Experimental Path.*, 1900, v. 44. Wood's *Therapeutics*, edition of 1897, p. 677, cites the original works of authorities who have shown that carbolic acid is oxidized in the body.

Prof. Burt G. Wilder—I am satisfied that the last speaker and her coworkers, like Prof. Atwater and our committee, are all seeking the same good end, the welfare of the race. We differ, as has been said, as to the soundness of certain doctrines and as to the desirability of certain subordinate aims and methods. Unfortunately these differences are radical. But I trust the report of our committee, so far as it goes, may be accepted as a deliberate and conscientious expression of our present views. The improbability of any material change in my own opinions may be inferred from the fact that they are now substantially what they have been for a third of a century. As a youth the subject gave me no concern. My parents were not total abstainers, but their four boys neither smoked nor drank, even beer, and I served through the civil war without once tasting whisky. But when, in 1868, I came to address the first freshman class at Cornell University on physiology and hygiene, I was compelled to decide what should be said to them, not merely as youths of that date but as future men and leaders in the community. And so, as if I had been their elder brother or their parent, I set myself prayerfully to ascertain what was the truth in this matter. I reached a certain conclusion, and that conclusion has not changed materially from that time to this. All that has been said, all that has been written, all the experiments that have been performed, all the arguments one way or the other, have not materially changed the opinion which I expressed then, which was practically embodied in the report of our committee today, and which I predict, though I may not live to see it, will be the prevailing opinion of the future, namely, that youths should avoid alcohol in every shape, for plenty of reasons; but that the average adult, who has not inherited a special tendency to be affected by alcohol, who is in ordinary health, under ordinary conditions, may use a certain limited amount, at meals only, and at the end of the day's work; furthermore, that all, even children, should be taught that this is the true doctrine. Personally, also, whatever freedom is permitted with respect to fermented beverages, wine or beer, I wish it were impossible to obtain at a saloon any distilled liquor to be drunk on the premises. One serious difficulty has yet to be overcome, viz. the inadequacy of the definitions of the terms that are employed in discussing this question. We have struggled with them and we are still at work. In particular, the phrase "moderate drinker," is evidently used in very different senses. With some it designates a person who is in peril himself and likely to harm others. But at a meeting called by advocates of " No License," the president of Harvard University declared himself to be a " moderate drinker, that is, not a total abstainer, but using alcohol in moderation."

Mrs Ella A. Boole—The organization I have the honor to represent, the Woman's Christian Temperance Union of the State of New York, has a membership of more than 22,000, and a following of 30,000, so that I am safe in saying that I represent 25,000 mothers. These women are vitally interested in the training of their children, and, if I had a boy, I should have been sorry to have him hear what seemed like a plea here this afternoon for moderate drinking.

A student from Cornell, on being warned by his mother against drinking, replied, " Mother, it has been proved that it will not hurt a fellow to drink a little liquor. Prof. Atwater says so, and he is a college professor." I do not believe that Prof. Atwater wants to be quoted by college students as approving moderate drinking, but, because he is a college professor, because he insists that alcohol is not a poison, even though he says that boys under 21 should not touch it, they will construe it as safe for them to take an occasional glass, and such teaching is dangerous.

It is charged that some children have received incorrect impressions; but as an old-time teacher with some years of experience, I always used to think that this result was a reflection on the teacher.

If this has been the result of some of the teaching of physiology and hygiene with special reference to the effects of alcoholics and narcotics, it certainly is a reflection on the teachers, that they have not presented the subject in such a way that it could be comprehended by the pupils; and I believe the fault lies in the fact that methods of teaching have not been presented in the normal schools and teachers institutes in such a way as to impress the teachers that the object of this instruction is to make of the boys and girls intelligent total abstainers from liquor and tobacco.

Another point. I do not believe that the investigation undertaken by this committee has been entirely fair. They have meant it to be so. But, as the inquiries sent out went mainly to male teachers, some of whom may be biased in their views because they themselves use tobacco, to make the investigation perfectly fair, questions should have been sent to an equal number of men and women teachers, for there are many that believe in the law.

There is another class of people that ought to be consulted, and that is the mothers of the state. We women have something more than money invested in the boys and girls of the state, and we want them taught the truth in our public schools in such a way that it will make them intelligent total abstainers from liquor and tobacco. I could bring you the testimony of mothers who tell about the boys coming home from school, and telling of the bad effects of alcohol. I could tell you of the Wayside Home in Brooklyn, where years ago the girls used to come, and say they did not know that beer would make them drunk, and they took it innocently. There is scarcely a girl who comes there now who says that, because the children are taught in the schools that the alcohol in the beer, wine and whisky is a poison, and that, taken in small quantities, it has the power to create the appetite for more. This instruction is bearing fruit and that to the saving of our boys and girls from strong drink.

Another thought. I should be very sorry to have this meeting this afternoon reported in the newspapers. You may not look at it in the way I do; but the liquor interests are all too ready to spread such thoughts abroad, and they will construe this report as presented here this afternoon as an indorsement of moderate drinking, and even they believe in that.

We as mothers must insist that the youth of the United States must be taught that the danger is in the first glass of alcoholic liquor, and that it is never safe for man, woman or child to consider that there is no danger in taking liquor occasionally.

It was said this afternoon that no law was ever obtained by the united efforts of the temperance forces and the teachers except the Connecticut law. I happened to be a state officer at the time the present law was obtained here in New York state, and was present at a conference in New York city where were present Sup't Skinner and a number of prominent teachers of the state, and where we agreed on some of the provisions of the present law. We conceded some things at that time that there might be harmonious relations between the teachers of the state and the Woman's Christian Temperance Union, for both are and ought to be vitally interested in the welfare of our future citizens.

Prof. Brigham—It seems to me that we are in danger of losing sight as an association of the report which has been presented to us. It is well that we should bear that in mind. I am sure it must be right for us to consider, and through the medium of a competent committee to investigate the question of fact, the question of pedagogy and the question of morals involved. It must be right and useful for us to have such a report presented as has been presented, and it must be safe that such a report should have publicity. Have we duly considered the spirit of this report? Have we considered the amount of patient investigation, the anxiety and labor which have gone into it? The presumption seems to be from the reading of that report that something is wrong with the teaching about alcohol. We are not here to decide on the fact, helpful as the statements of Prof. Atwater and others have been to us. We are here to be sure that we are in the way of finding out the facts and the ultimate principles on which we should act; and I think that all present, though divided on certain matters, should agree that the report is admirable; that there is reasonable presumption from what has been said by so many teachers in New York State that something is wrong with the teaching; that, if we are not teaching error, we are doing what is almost as bad, we are teaching truth in an exaggerated way, and I am principally concerned for the assurance which I desire to have that this committee is to continue its labors and be able to bring us some further light a year hence. I am sure you will all agree that the teaching of error never has been, and never can, under any circumstances, be good. There is no time now to discuss the effects on the teacher, or the effects on the pupil, of teaching even the truth in the way of overstatement; that is sure to work harm. I want to remind the association that, vitally interested as we all are in the problems of temperance, we are not here and now concerned with measures of temperance. We are concerned with finding out what is true on this particular question and how we shall present that truth to the children of the schools. And so I do not at all share the apprehensions of the last speaker, though I sympathize with her earnestness, as to the harm that is going to come from publicity, for "Truth is a good swimmer" and will gain the shore.

Mrs Graham—The circulars sent out from this committee on stimulants and narcotics naturally came into my hands. These circulars were read and discussed at the annual convention of the Woman's Christian Temperance Union of Onondaga county. Resolutions were passed at that convention and resolutions have been passed by both state and national conventions protesting very strongly against any movement to repeal the law of scientific temperance instruction in the schools. A committee to reply to these circulars was appointed by this convention, of which I have the honor to be the secretary. The replies were based on the consensus of the acknowledged authorities on the subjects touched on in the circulars. As soon as it was known in the state that there was a movement on foot to modify or repeal the scientific temperance instruction law, petitions began pouring in on me. I hold in my hand petitions which represent thousands and thousands of the women of this state. And petitions have come not only from the women but from the men, from every walk in life, from the mother in the home and from the teacher in the high school and college, from the leader of the primary department of the state Sunday school *association, from* a life insurance agency as well as from superintendents of homes for fallen women and unprotected girls, all protesting against any repeal or any modification of the present law, stating that they knew definitely, being the teachers of children, or men who have examined and investigated the habits of men for the purposes of insurance and see the necessity for greater enforcement, and a more intelligent and sympathetic treatment of the law and its teachings. All these come to me as protests from those who know the effects of the teaching on the present generation of children, and on all interests in the business and social world. I would like to read just one or two of these:

To the committee on stimulants and narcotics: "In behalf of the 1000 members of the Ulster county Woman's Christian Temperance Union, I earnestly urge the enforcement of the temperance education law," etc.

It seems to me that the one remedy which we need is not a change in the law, for the law wisely recognizes the great strides which science is making today, and says that "the *nature* of alcoholic drinks and other narcotics and their effects on the human system shall be taught in connection with the various divisions of physiology and hygiene, etc.,"[1] leaving to the findings of world-recognized scientific and medical men and bodies to declare what this *nature* is. Textbooks embodying these findings are written by experts along these lines. Not a change in the law, I repeat, but a greater knowledge on the part of the teacher. I too have been a teacher, and I know with what the teacher has to contend. I know the many duties that are hers, and I know too that, whenever a teacher has a wider and fuller knowledge of the subject which she has to teach, that subject takes on a new life and interest in her soul which must be and is felt by those under her instruction. Did you go on to the high school and college with a great love for mathematics? Did you make the greatest progress in that line of work? Then you must have had an enthusiastic teacher and an intelligent teacher, for that depends on truth alone. It is the truth that we are after, and, in all honor to the last speaker, I must say that what has been said this afternoon has a very close relation to the question at hand as represented by the committee, because the committee would have it taught that alcohol is not a poison. It is the truth we seek for ourselves and the children, and changing the state law of scientific temperance instruction will not help, but will positively hinder its being found. What we need is the hearty cooperation of teacher and temperance worker at the institutes and teachers meetings. If once in a while one of these meetings could be devoted to the instruction of teachers along temperance lines, by an expert, some one who by his life and experience or his professional studies or practice, has become an expert in that line—if such a one could be brought into contact with the teachers, do you not think there would be a better understanding of this subject and a more united and sympathetic working together for the child's highest good and that of the nation? For "Education is not a *preparation* for life, education *is* life."

---

[1] Ainsworth. School Physiology Law, with the amendments of 1896, section 1, § 19.

Prof. Frank Carney—As a member of this association, I move the acceptance of this partial report of the committee on stimulants and narcotics, and also that the committee be continued.

Prof. R. E. Dodge—I second that motion. I feel that it must be extremely discouraging for a committee to work for four years to make a fair report and go away feeling that they have not received the support of the association. It seems to me that this report is the most scholarly, the most careful, the most conservative which has been presented before this association in the years that I have attended the meetings; and I think we ought to support Prof. Bishop and his colleagues in their statements that children should abstain, that they should be taught habits of self-denial, and that we must leave it to the adult to decide what he is going to do along this line.

[The report of the committee was accepted as a report of progress and the committee asked to continue its *investigations.]*

Mrs Martha M. Allen—I simply wished to say that the medical journals have contained many articles in opposition to Prof. Atwater's conclusions. While these articles admit that Prof. Atwater's experiments settle what was heretofore disputed, that alcohol is oxidized in the body, they declare that too much has been claimed as proved by the experiments; that it has not been proved that alcohol is a food. These writers show from Prof. Atwater's own published figures that he is in error in some of his main conclusions as presented here today.

Those physiologists who teach that alcohol is a poison experimented on animals, and afterward killed the animals, thus obtaining evidence of poisonous effects. Prof. Atwater is not a physiologist; he is a chemist. His experiments were on a man, hence he could not kill his animal to know the effects of alcohol on the tissues. His experiments were very limited.

MEMBERS 1901

When the name of an institution includes the name of its town or city, the latter is not repeated. Where no state abbreviation appears, New York is to be understood.

Allen, Charles M., Pratt Institute, Brooklyn
Allen, John G., Rochester High School
Anderson. W. W., Dobbs Ferry
Andrews, Kate R., 24 Kelly Hall, University of Chicago, Ill.
Arey, Albert L., Rochester High School
Armstrong, Charles H., 109 W. 54th st. New York
Arnold, J. L., 225 E. 23d st. New York
Atkinson, George F., Cornell University, Ithaca
Atwater, J. C., Canandaigua Academy

Babcock, Edward S., Alfred University
Barber, H. G., 241 W. 135th st. New York
Bardwell, D. L., Binghamton High School
Barrows, Franklin W., Buffalo Central High School
Beach, Channing E., Buffalo School 23
Beach, Grace B., 322 St Nicholas av. New York
Beadel, Charles W.
Bean, Charles M., Pulaski Academy and Union School
Belknap, Emmet, Lockport High School
Bennett, William M., 76 Wellington av. Rochester
Benoliel, Sol. D., 206 Washington park, Brooklyn
Bevier, Marie L., 106 W. 61st st. New York
Bickmore, Mary E., 30 W. 128th st. New York
Bigelow, Maurice A., Teachers College, New York
Binns, Charles F., N. Y. State School of Clay-working and Ceramics, Alfred
Bishop, Irving P., Buffalo Normal School
Blossom, Margaret, 183 Columbia st. Brooklyn
Bogert, Marston T., Columbia University, New York
Bond, William E., Potsdam Normal School
Boniface, Sister M., Nazareth Academy, Rochester
Booth, W. M., Cortland Normal School
Bowers, Emma, 100 Hector st. Ithaca
Brace, Edith H., 40 Courtlandt st. Rochester
Bradley, Theodore J., Albany Academy
Brigham, Albert P., Colgate University, Hamilton
Bristol, Charles L., New York University
Bronson, B. S., Geneseo Normal School
Brown, Miriam R., Erasmus Hall High School, Brooklyn
Brownell, W. A., 905 University av. Syracuse
Brownlee, R. B., Brockport
Burchell, Durward E., Oswego Normal School

Burgin, Bryan O., Albany High School
Burlingham, Gertrude S., 93 Oak st. Binghamton
Burr, Charles H., White Plains High School

Call, Richard E., Erasmus Hall High School, Brooklyn
Callahan, Eugene B., Richfield Springs High School
Carey, E. L., St John's College, Brooklyn
Carney, Frank, Ithaca High School
Carpenter, Idalette, Maplewood (N. J.) High School
Carss, Elizabeth, Teachers College, New York
Case, L. V., Washington Irving High School, Tarrytown
Cate, Eleazor, 16 Ashburton place, Boston Mass.
Cattell, J. McKeen, Garrison on Hudson
Chambers, V. J.
Chesebrough, Thomas U., Little Falls High School
Chollar, Sarah V., Potsdam Normal School
Christian, Elizabeth, 8 Kemble st. Utica
Clapp, Byron G., Fulton High School
Clark, John A., Ithaca High School
Clark, O. D., Brooklyn Boys High School
Clark, Tracy E., 102 Macon st. Brooklyn
Clarke, John M., New York State Museum, Albany
Clement, Arthur G., Regents office, Albany
Clendennin, W. D., Wadleigh High School, New York
Cobb, Charles N., Regents office, Albany
Colby, E. C., Rochester Atheneum and Mechanics Institute
Comstock, J. H., Cornell University, Ithaca
Congdon, E. D., Dobbs Ferry High School
Cooley, LeRoy C., Vassar College, Poughkeepsie
Cornish, R. H., Wadleigh High School, New York
Crawford, A. Myrtilla, Buffalo Central High School
Crissey, Jay, Sup't of schools, Penn Yan
Curry, C. M., Cortland Normal School
Curry, Mrs Sarah E., 70 N. Main st. Cortland
Curtis, Arthur M., Oneonta Normal School

Dann, Mary E., 413 Clinton st. Brooklyn
Davenport, Charles B., University of Chicago, Ill.
Dean, Phillip R., 60 W. 13th st. New York
Denham, Henry H., Buffalo Central High School
DeShon, Charles H., 646 Elm st. Buffalo
Dodge, Charles W., 330 Oxford st. Rochester
Dodge, Richard E., Teachers College, New York
Doll, Carrie L., 587 Ellicott st. Buffalo
Doremus, C. A., 59 W. 57th st. New York
Duvall, C. A., Syracuse

Elliott, Arthur H., 49 Whitestone av. Flushing
Emerson, Josephine, Pratt Institute, Brooklyn
Erickson, Dan E., 74 Fifth av. New York (or Chicago)
Evans, Susan, 205 Court st. Rome

Fairbanks, Floyd C., Geneva High School
Farnham, Amos W., Oswego Normal School
Fish, Pierre A., New York State Veterinary College, Ithaca
Fleming, Mary A., 432 Pearl st. Buffalo
Fox, Ada H., Masten Park High School, Buffalo
Freley, J. W., Wells College, Aurora
Fuller, R. W., DeWitt Clinton High School, New York

Gage, O. A., University of Rochester
Gage, Simon H., Cornell University, Ithaca
Gager, O. Stuart, New York State Normal College, Albany
Gaines, E. V., Adelphi College, Brooklyn
Gano, Seth T., Edmeston High School
Gardner, George S., 141 Clifton st. Rochester
Gemmel, Marion, Masten Park High School, Buffalo
Gibson, J. J., Montclair N. J.
Gifford, T. I., Pike Seminary
Gillmore, Gertrude, 49 Garden place, Brooklyn
Glavin, John F., St John's Academy, Rensselaer
Goodrich, Arthur L., Utica Free Academy
Gorton, J. Irving, Ossining High School
Graham, W., Syracuse University
Green, E. A., Williamsport High School
Greene, W. J., Hoosick Falls High School
Greenwood, John W., Masten Park High School, Buffalo
Griffis, Henry L., New Paltz Normal School

Haanel, Eugene, Syracuse University
Hale, Albert C., 352A Hancock st. Brooklyn
Hall, James H., Cazenovia Seminary
Hallock, William, Columbia University, New York
Hancock, W. J., Erasmus Hall High School, Brooklyn
Hanna, Jennie P., 23 Prospect st. Rochester
Hargitt, Charles W., Syracuse University
Harris, C. Everett, Rochester High School
Hartnagel, Chris A., Hornellsville High School
Hering, D. W., New York University
Herrick, Lillian B., 408 Union place, Elmira
Hixon, Kate B., 24 E. 128th st. New York
Holdredge, L. I., Hudson High School
Hopkins, T. C., Syracuse University
Hoxie, Jane L., 109 W. 54th st. New York

Hudson, George H., Plattsburg Normal School
Humphrey, O. D., Jamaica (L. I.) Normal School
Hunt, Arthur E., Manual Training High School, Brooklyn
Hurd, Frances, Oneonta Normal School

Jameson, J. M., Pratt Institute, Brooklyn
Jaquish, Benjamin M., 204 W. 106th st. New York
Jewett, Franklin N., Fredonia Normal School

Karr, Grant, Oswego Normal School
Kauffman, W. L., Yonkers High School
Kelly, Henry A., 109 W. 54th st. New York
Kelly, Mrs H. A., 669 Madison av. New York
Kemp, James F., Columbia University, New York
Kenyon, O. C., 110 Lancaster av. Syracuse
Kingsbury, George H., Elmhurst High School
Kingsley, Julius Stanton, Newark Valley High School
Kirkwood, J. E., Syracuse University
Kittredge, R. J., Schenectady Union Classical Institute
Knapp, Allen H., Canton High School
Kneil, Thomas R., Saratoga Springs High School

Langworthy, William F., Colgate Academy, Hamilton
Leary, Montgomery E., Rochester Atheneum and Mechanics Institute
Lee, Frederic S., Columbia University, New York
Lennon, Alice L., Brockport Normal School
Lennon, W. H., Brockport Normal School
Lewis, Fred Z., Brooklyn Boys High School
Linville, Henry R., DeWitt Clinton High School, New York
Lloyd, Francis E., Teachers College, New York
Loeb, Morris, New York University
Logan, Mrs Mary C., Lyons High School
Lovell, Thomas B., Niagara Falls High School
Lyon, Catherine E., Brooklyn
Lyon, Howard, Oneonta Normal School

McGreevy, Thomas, 200 Albany st. Buffalo
McKay, John S., Packer Collegiate Institute, Brooklyn
McMurry, Frank M., Teachers College, New York
Mann, Warren, Potsdam Normal School
Mar, Frederick W., Brooklyn Boys High School
Marcella, Sister M., Nazareth Academy, Rochester
Matteson, Florence M., Oneonta Normal School
Maury, Mytton, 37 E. 21st st. New York
Mead, F. L., Madison School, Syracuse
Mercer, W. F., Chamberlain Institute, Randolph
Merrell, William D., University of Rochester
Merrill, *F. J. H., New York* State Museum, Albany

Meserve, Elizabeth E., Utica Free Academy
Miller, Gertrude, Penn Yan Academy
Miller, Mrs Mary Rogers, Cornell University, Ithaca
Milliman, Lennette G., 100 Kenwood av. Rochester
Moler, G. S., 106 University av. Ithaca
Moore, Katherine R., 24 E. Ellen st. Greenwich Ct.
Morrey, William T., Peter Cooper High School
Morrill, Albro D., Hamilton College, Clinton
Morse, Charles F., DeWitt Clinton High School, New York
Morse, H. L. F., Troy High School
Moulthrop, S. P., Rochester Washington Grammar School
Multer, W. J., Bay Shore High School

Nichols, Edward L., Cornell University, Ithaca
Norris, Isadora M., Springville High School

O'Neill, Everett, Regents office, Albany
Osborn, Henry F., Columbia University, New York

Paddock, Bertha L., Franklin Academy and Plattsburg High School, Malone
Palmer, Lella B., North Bridgewater
Pattee, Ernest N., Syracuse University
Peabody, James E., 138 W. 137th st. New York
Peck, Henry A., 307 Waverly place, Syracuse
Peckham, W. C., Adelphi College, Brooklyn
Piez, Richard K., Oswego Normal School
Pingrey, Mrs Cora E., White Plains High School
Piper, P. F., Buffalo Central High School
Pollock, Horatio M., State Civil Service Commission
Proper, Emberson E., Brooklyn Boys High School

Randall, Charles W., Lockport High School
Raneson, Edward B., 226 E. 16th st. New York
Reed, Raymond C., New York State Veterinary College, Ithaca
Reynolds, Roberta, 322 Fox st. Buffalo
Rich, J. F., Batavia
Richards, Charles R., Teachers College, New York
Richards, Charles W., Oswego High School
Robinson, Emma C., 419 S. 1st av. Mount Vernon
Rogers, Charles G., Syracuse University
Rogers, F. J., Cornell University, Ithaca
Rollins, Frank, 356 W. 145th st. New York
Rowlee, W. W., Cornell University, Ithaca

Sage, L. Belle, 413 Laurens st. Olean
St John, Thomas M., 352 W. 56th st. New York
Sampson, Ezra W., Mott av. and 144th st. New York

Sanial, Marie L., 1180 Boston av. New York
Schmitz, H. J., Geneseo Normal School
Schneider, Philip F., Syracuse High School
Schüssler, Amy, Teachers College, New York
Scott, Charles B., Oswego Normal School
Scribner, E. E., Dunkirk High School
Seymour, A. T., 3080 3d av. New York
Sharp, Clayton H., Cornell University, Ithaca
Shatz, Josephine, Rochester High School
Shearer, John S., Cornell University, Ithaca
Sheldon, C. S., Oswego Normal School
Sherwood, Leora E., Syracuse High School
Sieberg, W. H. J., 138 W. 126th st. New York
Sleeper, Joseph J., Room 810 Provident bldg. 4th and Chestnut st. Philadelphia Pa.
Smith, Owen R., Amsterdam High School
Smith, V. J., Gloversville
Spice, Robert, Cooper Union, New York
Stocker, John H., 124 Hancock st. Brooklyn
Stoller, James H., Union University, Schenectady
Stone, Anna J., Binghamton
Stowell, T. B., Potsdam Normal School
Sweetland, Libbie, Dryden

Tappan, Frances, Oneonta Normal School
Tarr, Ralph S., Cornell University, Ithaca
Taylor, Joseph S., 2275 Aqueduct av. University Hights, New York
Taylor, R. A., Niagara Falls High School
Taylor, S. N., Syracuse University
Tenney, Lloyd S., Brockport Normal School
Thomas, M. Smith, Pike Seminary
Thurston, R. H., Cornell University
Trant, Amelia E., Masten Park High School, Buffalo
Turner, George M., Masten Park High School, Buffalo

Underwood, L. M., Columbia University, New York

Van Arsdale, May B., Teachers College, New York
Vogt, Frederick A., Buffalo Central High School
von Nardroff, C. R., Erasmus Hall High School, Brooklyn
Vosburgh, Charles H., Jamaica L. I.
Vulté, H. T., Columbia University, New York

Ward, Charles H., 47 Mt Hope av. Rochester
Ward, Delancy W., 215 W. 42d st. New York
Warner, A. R., 36 Franklin st. Auburn
Webb, Harry E., Pratt Institute, Brooklyn
Weed, Henry T., Manual Training High School, Brooklyn

Wetmore, Edward W., New York State Normal College, Albany
Wetmore, Katherine S., 108 S. Fitzhugh st. Rochester
Wheelock, Charles F., Regents office, Albany
Whitney, E. R., Binghamton High School
Wilber, T. C., Waterloo
Wilcox, C. C., Starkey Seminary, Eddytown
Wilder, Burt G., Cornell University, Ithaca
Willard, A. Blanche, Waterville
Williston, Arthur L., Pratt Institute, Brooklyn
Wilson, John D., Putnam School, Syracuse
Wilson, Victor T., Cornell University, Ithaca
Wixom, F. C., Penn Yan Academy
Wolcott, Henry G., Clifton Springs High School
Woodhull, John F., Teachers College, New York
Woodland, J. E.
Wyckoff, Adelaide E., 58 Hanson place, Brooklyn

ATTENDANTS 1901

Allen, Charles M., Pratt Institute, Brooklyn
Allen, Mrs Martha M., Syracuse
Atwater, J. C., Canandaigua Academy
Atwater, W. O., Wesleyan University, Middletown Ct.
Bardwell, Darwin L., Binghamton High School
Barrows, Franklin W., Buffalo Central High School
Barrus, R. M., Keuka College
Beach, Channing E., Buffalo School 23
Bean, Charles M., Pulaski Academy and Union School
Binns, Charles F., N. Y. State School of Clay-working and Ceramics, Alfred
Bishop, Irving P., Buffalo Normal School
Bliss, Carrie H., Leavenworth Institute and Wolcott High School, Wolcott
Boniface, Sister M., Nazareth Academy, Rochester
Boole, Mrs Ella A., Woman's Christian Temperance Union, Brooklyn
Booth, W. M., Cortland Normal School
Brigham, Albert P., Colgate University, Hamilton
Britt, W. Warren, LeRoy High School
Bronson, B. S., Geneseo Normal School
Brown, Miriam R., Erasmus Hall High School, Brooklyn
Brownell, W. A., 905 University av. Syracuse
Brownlee, R. B., Brockport
Burchell, Durward E., Oswego Normal School
Burgin, Bryan O., Albany High School
Burlingham, Gertrude S., 93 Oak st., Binghamton
Burr, Charles H., White Plains High School
Callahan, Eugene B., Richfield Springs High School
Carney, Frank, Ithaca High School

Carss, Elizabeth, Teachers College, New York
Cattell, J. McKeen, Garrison on Hudson
Clark, Charles R., Remsen High School
Clark, G. P., Syracuse University
Clement, Arthur G., Regents office, Albany
Clendennin, W. D., Wadleigh High School, New York
Cobb, Charles N., Regents office, Albany
Comstock, J. H., Cornell University, Ithaca
Congdon, E. D., Dobbs Ferry High School
Dann, Mary E., 413 Clinton st. Brooklyn
Didama, Henry D., Syracuse University
Dodge, Charles W., 330 Oxford st. Rochester
Dodge, Richard E., Teachers College, New York
Drum, C. R., Montgomery School, Syracuse
Fairbanks, Floyd C., Geneva High School
Farnham, Amos W., Oswego Normal School
Gager, C. Stuart, New York State Normal College, Albany
Gilley, Frank M., Chelsea (Mass.) High School
Graham, Mrs Cora D., Syracuse
Green, E. A., Williamsport High School
Greenwood, John W., Masten Park High School, Buffalo
Grout, A. J., Brooklyn Boys High School
Hall, James H., Cazenovia Seminary
Hallock, William, Columbia University, New York
Hargitt, Charles W., Syracuse University
Hartnagel, Chris A., Hornellsville High School
Harvey, N. A., Chicago (Ill.) Normal School
Hill, Mary E., Goodyear-Burlingame School, Syracuse
Holdredge, L. I., Hudson High School
Hopkins, T. C., Syracuse University
Hunt, Arthur E., Manual Training High School, Brooklyn
Hunt, Mrs Mary H., Woman's Christian Temperance Union, Boston
Jameson, J. M., Pratt Institute, Brooklyn
Jewett, Franklin N., Fredonia Normal School
Karr, Grant, Oswego Normal School
Kenyon, O. C., 110 Lancaster av. Syracuse
King, Alice Cynthia, Utica City Training School
Kirkwood, J. E., Syracuse University
Kittredge, R. J., Schenectady Union Classical Institute
Kneil, Thomas R., Saratoga Springs High School
Langworthy, William F., Colgate Academy, Hamilton
Lewis, Fred Z., Brooklyn Boys High School
Linville, Henry R., De Witt Clinton High School, New York
Lloyd, Francis E., Teachers College, New York
Long, Eli H., University of Buffalo
Longwell, Elizabeth J., Penn Yan
Lovell, *Thomas B., Niagara Falls* High School

Lyon, Howard, Oneonta Normal School
MacFarlane, C. T., Brockport Normal School
McMurry, Frank M., Teachers College, New York
Marcella, Sister M., Nazareth Academy, Rochester
Mershon, Bessie DeWitt, Utica
Meserve, Elizabeth E., Utica Free Academy
Miller, Gertrude, Penn Yan Academy
Miller, Mrs Mary Rogers, Cornell University, Ithaca
Monroe, W. S., Westfield (Mass.) Normal School
Morrill, Albro D., Hamilton College, Clinton
Mosher, C. L., Canton High School
Multer, W. J., Bay Shore High School
Newell, Lyman C., Lowell (Mass.) Normal School
O'Neill, Everett, Regents office, Albany
Paessler, V. S., Barlow School of Industrial Arts, Binghamton
Pattee, Ernest N., Syracuse University
Peabody, James E., 138 W. 137th st. New York
Peckham, W. C., Adelphi College, Brooklyn
Pingrey, Mrs Cora E., White Plains High School
Piper, P. F., Buffalo Central High School
Randall, Charles W., Lockport High School
Rogers, Charles G., Syracuse University
Round, R. J., Elmira School 3
Saunders, Samuel J., Hamilton College, Clinton
Schmitz, H. J., Geneseo Normal School
Schneider, Philip F., Syracuse High School
Shatz, Josephine, Rochester High School
Sheldon, C. S., Oswego Normal School
Sherwood, Leora E., Syracuse High School
Smith, Owen R., Amsterdam High School
Spencer, John W., Cornell University, Ithaca
Stoller, James H., Union University, Schenectady
Stowell, T. B., Potsdam Normal School
Tenney, Lloyd S., Brockport Normal School
Thwing, Charles B., Syracuse University
Turner, George M., Masten Park High School, Buffalo
Walden, George H., Rochester School 10
Warner, A. R., 36 Franklin st. Auburn
Wetmore, Edward W., New York State Normal College, Albany
Wheelock, Charles F., Regents office, Albany
Whitney, E. R., Binghamton High School
Whittaker, Elizabeth, Brookton
Wilcox, C. C., Palmer Institute—Starkey Seminary, Lakemont
Wilder, Burt G., Cornell University, Ithaca
Young, I. E., New Rochelle High School

INDEX

Action, summary of, 527-29.
Alcohol, effects of: report of progress of committee, 745-62; textbooks, 746-47, 797-99; opinions of committee regarding effects, 748-50; opinions of educators, 751-60; conclusions of committee from investigations, 760-61; recommendations of committee, 761-62; Alcohol physiology in the public schools, paper by W. O. Atwater, with discussion, 762-815; opinions of leading authorities, 767-79; experiments of Prof. Atwater, 776-79, 803-5, 815; what we should not teach, 780-84; what we should teach, 784-86; errors in current temperance teaching, 787-93; ethical considerations, 787-93; legislation on, 793-97, 811; Connecticut school physiology law, 794-97; Dr Rosemann's experiments, 803-4; report of committee accepted and committee continued, 814.
Allen, Charles M., Chemical laboratory notes, 655-61.
Allen, Mrs Martha M., on effects of alcohol, 815.
Appointments, 527.
Attendants, list, 822-24.
Atwater, W. O., Alcohol physiology in the public schools, 762-97; on oxidation of alcohol, 800-1.
Auditing committee, 527; report, 529.

Bardwell, Darwin L., What is the minimum nature study training for a teacher in an elementary school, 630-33.
Barrows, Franklin W., address, 530-31.
Beach, Channing E., Suggestions for a teachers class in nature study, 643-48.
Binns, Charles F., on training of teacher of physics, 592; on scientific education, 655.
Biology, Preparation of secondary teachers in, paper by F. E. Lloyd, with discussion, 607-15; Ideals in teaching, paper by A. D. Morrill, with discussion, 671-78.
Bishop, Irving P., report of progress of committee on effects of stimulants and narcotics, 745-62.
Boole, Mrs Ella A., on teaching effects of alcohol, 809-11.
Botany, value in systematic work, 563; study of types, 565; teacher of, in secondary schools, by A. J. Grout, 615-17; standard college entrance option in, 736-42.
Brigham, Albert P., on study of types, 575-76; on work in physical geography, 714; on teaching effects of alcohol, 811-12.
Bunge, quoted, 798.
Burchell, Durward E., on laboratory work in chemistry, 661.

Callahan, Eugene B., on science teaching, 678.
Carney, Frank, on report of committee on stimulants and narcotics, 814.
Carss, Elizabeth, Where and how can nature study training be obtained? 634-40.
Chemistry, preparation and training of the teacher of, by L. C. Newell, 593-606; laboratory work, 601-6; laboratory notes, paper by C. M. Allen, with discussion, 655-62; college entrance preparation of students, paper by R. J. Kittredge, with discussion, 648-55.
Clement, Arthur G., on research work, 546; on Regents examinations, 546-47, 552; on training of teachers, 614.
Cobb, Charles N., on training of teacher of physics, 589-90.
College entrance preparation of students as viewed from the sec-

ondary school man's standpoint, paper by R. J. Kittredge, with discussion, 648-55.
Committee of seven, report of, by R. E. Dodge, with discussion, 608-714; continued, 529, 714.
Committees, appointed, 527; reports, 528.
Connecticut school physiology law, 794-97.
Current Encyclopedia, 581.

Didama, Henry D., on teaching effects of alcohol, 801-3.
Dodge, Richard E., Report of the committee of seven, 688-709; on report of committee on stimulants and narcotics, 814.
Drum, C. R., on nature study, 714-18.

Earth science, 618-30, 688-714.
Examinations, 545-46, 547, 552, 553, 568.
Executive council, report of meeting, 527.

Farnham, Amos W., Geography for training students in normal schools, 618-22.
Foster, Prof., quoted, 773-75.

Gager, C. Stuart, Geography for training students in normal schools, 622-29.
Geography, course of study in, 529; use of types in, 575; bibliography, 629.
Geography for training students in normal schools, by A. W. Farnham and C. S. Gager, 618-30.
Geology should be dropped from Academic Syllabus of *1905*, 695.
Gilley, Frank M., How to meet the problem of teaching physics by the laboratory method in secondary schools, 662-71.
Graham, Mrs Cora D., on teaching effects of alcohol, 812-14.
Grout, A. J., on tyranny of examinations, 545-46, 547, 552, 553; What the teacher of botany in secondary schools should be prepared to do, 615-17; on training of science teachers, 686.

Hargitt, Charles W., address of welcome, 530; on research work for the science teacher, 545; on study of types, 572-74; on models illustrating experimental work, 577; on science teaching, 676-77; on deficiencies of normal school teachers, 686-87.
Harvey, N. A., on research work, 549-52, 553; on examinations, 552; Study of types, 554-68, 574-75, 576-77; on nature study, 641-42; on science teaching, 675-76; Training of a science teacher for secondary schools, 678-86.
Hill, Mary E., on nature study, 722-25.
Hunt, Dr, quoted, 798.
Hunt, Mrs Mary H., on effects of alcohol, 797-99, 803-7; on oxidation of certain poisons, 807.

Ideals in teaching, paper by A. D. Morrill, with discussion, 671-78.

James, Prof., quoted, 590.
Jewett, Franklin N., on research work for the science teacher, 547-48.

Karr, Grant, on study of types, 568-72; on training of science teachers, 687.
Kittredge, R. J., College entrance preparation of students as viewed from the secondary school man's standpoint, 648-54.
Koppe, Dr, quoted, 798, 806.

Latin, leading subject in scientific education, 655.
Life, problem of origin of, 582-84.

Linville, Henry R., on training of teachers, 614; on laboratory work in biology, 675; on high school teachers in science, 744-45.
Literary Digest, science department, 581.
Lloyd, Francis E., Preparation of secondary teachers in biology, 607-14; on teachers of botany, 617; on educational fads, 677; on training of science teacher, 686; Standard college entrance option in botany, 736-42.
Lockyer, Dr, quoted, 538-39.
Lyon, Howard, on training of teacher of physics, 590-92.

MacFarlane, C. T., on relations of life to énvironment, 629-30.
McMurry, F. M., on training of teachers, 614-15.
Members, list, 816-22.
Mershon, Bessie Dewitt, on nature study, 725-31.
Meserve, Elizabeth E., on teaching physical geography, 710-14.
Miller, Mrs Mary Rogers, on nature study training for teachers, 634.
Monroe, Will S., on teaching anthropo-geography in normal schools, 630.
Morrill, Albro D., on examinations, 553; Ideals in teaching, 671-75, 678.

Nature study, summer courses in, 635; teachers class in, by C. E. Beach, 643-48; discussion, 714-36.
Nature study training, where and how obtained, paper by Elizabeth Carss, with discussion, 634-43.
Nature study training for a teacher in an elementary school, paper by D. L. Bardwell, with discussion, 630-34.
Newell, Lyman C., Preparation and training of the teacher of chemistry, 593-606; on high school teachers of science, 742-44.
Nominations, committee on, 527; report of committee, 528.
Normal schools, training teachers for the high schools, 608, 682; place and purpose, 618; deficiencies of teachers, 686-87.

Officers elected, 528.

Parkes, E. A., quoted, 775.
Pattee, Ernest N., on laboratory work in chemistry, 661.
Payson, Dr, quoted, 726.
Physical geography, laboratory exercises, 529, 619; requirements as outlined by the College Entrance Examination Board, 689-94; course of study for the high school, 696-709; bibliography, 709-10.
Physics, Preparation and training of the teacher of, paper by C. B. Thwing, with discussion, 577-93; College entrance preparation of students, paper by R. J. Kittredge, with discussion, 648-55; teaching by the laboratory method in secondary schools, by F. M. Gilley, 662-71.
Physiologic effects of alcohol, 745-815.
Physiology, models illustrating experimental work, 577.

Regents examinations, 546, 552.
Research work in the training of the science teacher, by S. J. Saunders, with discussion, 532-54; by N. A. Harvey, 683.
Resolutions, committee on, 527; adopted, 529.
Rosemann, Dr, experiments on effects of alcohol, 803-4.
Round, R. J., on nature study, 731-36.

Saunders, Samuel J., Value of research work in the training of the science teacher, 532-45, 553-54; on examinations, 553.

Schmitz, H. J., on training of teacher of physics, 592; on scientific and classical education for young pupils, 654-55.

Science and theology, relations, 582.

Science teachers, Value of research work in the training of, paper by S. J. Saunders, with discussion, 532-54; Preparation and training of the teacher of physics, paper by C. B. Thwing, with discussion, 577-93; Preparation and training of the teacher of chemistry, by L. C. Newell, 593-606; Preparation of secondary teachers in biology, paper by F. E. Lloyd, with discussion, 607-15; teacher of botany in secondary schools, by A. J. Grout, 615-17; Geography for training students in normal schools, by A. W. Farnham and C. S. Gager, 618-30; nature study training for, papers and discussion, 630-48; Ideals in teaching biology, by Albro D. Morrill, 671-78; training for secondary schools, paper by N. A. Harvey, with discussion, 678-87; symposium on work of high school teachers in science, 742-45.

Science teaching, study of types, 554-77.

Sheldon, C. D., on normal school nature study, 640-41.

Spencer, John W., on nature study, 718.

Steele's *Hygienic Physiology*, statement concerning, 799.

Stimulants and narcotics, 745-815.

Teachers, qualifications, 607-10. *See also* **Science teachers.**

Teachers class in nature study, by C. E. Beach, 643-48.

Theology and science, relations, 582.

Thwing, Charles B., Preparation and training of the teacher of physics, 577-88, 580, 592-93.

Treasurer's report, 528.

Turner, George M., on research work for the science teacher, 548-49; on training of teacher of physics, 588.

Types, study of, paper by N. A. Harvey, with discussion, 554-77.

Whittaker, Elizabeth, on clubs of nature study for children, 719-22.

Wilder, Burt G., on effects of alcohol, 807-9.

Zoology, study of types, 558; value in systematic work, 563.

University of the State of New York

High School Department

PUBLICATIONS

Examination department annual reports 1894-97. O. *75c a vol.*

Till 1894 these reports formed part of the general University reports, known as the Regents reports. They cover courses of study in secondary schools, examination of professional students, licensing examinations for physicians, dentists, veterinary surgeons and certified public accountants.

Continued in 1898 as reports of College and High School Departments.

Examination bulletins 1895-98. O. *To advance subscribers 50c a year.*

B4 (Examinations 1) Regents Examinations. 82p. Nov. 1890. *10c.*

Historical sketch, laws, ordinances and rules pertaining to all examinations conducted by the Regents; details as to all University credentials; subjects, times and places of examinations 1891-95; notes on the reorganization of 1890.

B5 (Examinations 2) Academic Syllabus. 174p. Ap. 1891. *Replaced by X8.*

B10 (Examinations 3) Medical Syllabus. 30p. Oct. 1892. *Replaced by X7.*

B13 (Examinations 4) *Law Syllabus.* 120p. Mar. 1893. *Out of print.*

Outline of ground covered by examinations for the Regents degree of bachelor of laws.

B23 (Examinations 5) Report of Examination Department 1893. 82p. Feb. 1894. *10c.*

X6 Report of Examination Department 1894. 126p. Mar. 1895. *15c.*

X7 Medical Syllabus. 128p. Mar. 1895. *25c.*

Outline of ground covered by State licensing examinations, prepared under direction of state boards of medical examiners for guidance of candidates.

X8 Academic Syllabus. 204p. June 1895. *Replaced by X24.*

Syllabus of Form Study and Drawing. 30p. 32pl. *25c.*

Reprint of p. 410-34d and plates from X8.

X9 Report of Examination Department 1895. 108p. Feb. 1896. *15c.*

X10 Examination Papers 1896. 502p. Oct. 1896. *50c; small paper edition uniform with previous volumes 25c, boards 50c.*

See also Question papers.

X11 Davis, W: M. (Harvard) State Map of New York as an Aid to the Study of Geography. 28p. Nov. 1896. *5c.*

Based on the topographic map in preparation by the United States Geological Survey.

X12 Report of Examination Department 1896. 114p. Jan. 1897. *15c.*

X13 College-entrance English. 148p. June 1897. *15c.*

Present English entrance requirements of representative colleges and universities. Also discussions on aims and methods in teaching secondary school English.

X14 Examination Papers 1897. 578p. Aug. 1897. *Price, see X10.*

X15 Report of Examination Department 1897. 120p. Nov. 1897. *15c.*

X16 Examination Papers 1898. 512p. Sep. 1898. *Price, see X10.*

The second edition contains only the academic papers, the professional papers being printed *separately* as College bulletin 3.

High school department annual reports 1898–date. O. *75*

High school department bulletins 1898–date. *To advanc scribers 50c a year.*

X17 (High school 1) Director's Report 1898. Mar. 1899. 122p.

X18 (High school 2) State Science Teachers Association. Pro ings of the Third Annual Meeting, Dec. 1898. 202p. Nov. *Out of print.*

X19 (High school 3) Associated Academic Principals. Proceed of the 14th Annual Conference, Dec. 1898. 236p. Dec. 1899. 25

X20 (High school 4) Academic Examination Papers 1899. 3 Oct. 1899. *25c. Small size, 12.5 x 20cm, 25c; boards 50c.*

X21 (High school 5) Director's Report 1899. 70p. Feb. 1900.

X22 (High school 6) Associated Academic Principals. Proceed of the 15th Annual Conference, Dec. 1899. 188p. Mar. 1900. 20

X23 (High school 7) State Science Teachers Association. Proc ings of the Fourth Annual Meeting, Dec. 1899. 302p. May 1900. 35

X24 (High school 8) Academic Syllabus. 176p. Ap. *25c; cloth 50c.*

The University declines to recommend any special textbooks, but for guidance of teachers and students it specifies the ground covered by the liminary and academic subjects. This syllabus is the best available outl what should be accomplished in these subjects.

X25 (High school 9) Manual Training Syllabus. 60p. May 1900.

X26 (High school 10) Academic Examination Papers 1900. Aug. 1900. *Price, see X20.*

X27 (High school 11) Director's Report 1900. 38p. Feb. 1901.

X28 (High school 12) Associated Academic Principals. Proce of the 16th Annual Conference, Dec. 1900. 164p. Ap. 1901.

X29 (High school 13) State Science Teachers Association. Pro ings of the Fifth Annual Conference, Dec. 1900. 250p. May 1901.

X30 (High school 14) Academic Examination Papers 1901 Aug. 1901. *Small size, 12.5 x 20cm, 25c; boards 50c.*

X31 (High school 15) Director's Report 1901. 34p. Jan. 1902.

X32 (High school 16) Associated Academic Principals. Procee of the 17th Annual Conference, Dec. 1901. 196p. Mar. 1902. 25

X33 (High school 17) State Science Teachers Association. Proc ings of the Sixth Annual Conference, Dec. 1901. 312p. Oct. 1902.

X34 (High school 18) Academic Examination Papers 1902. July 1902. *Price, see X20.*

Question papers. For the academic year 1892 (v. 1); 1893 (1894 (v. 3); 1895 (v. 4). D. *25c; boards 50c.*

For 1896-98 *see* X10, X14, X16; 1899 *see* X20; 1900 *see* X26; 1901 *see* 1902 *see* X34. Till 1898 each volume contained all the Regents question p of the year in any of the academic, professional law, medical, de veterinary, library and extension examinations. After the first editi the 1898 examination papers the academic and professional papers separated.

Published monthly by the
University of the State of New York

BULLETIN [illegible] JULY 1902

High School Department

INCLUDING ACADEMIES AND ALL INTERESTS OF SECONDARY EDUCATION

Bulletin 18

U. S. N. Y. High School Dept:

ACADEMIC EXAMINATION PAPERS

FOR THE

Academic year 1902

	PAGE		PAGE
Preface	4	Science	215
English language and literature	5	History and social science	242
Foreign languages	73	Other studies	274
Mathematics	101		

ALBANY
UNIVERSITY OF THE STATE OF NEW YORK
1902

Price 25 cen

University of the State of New York

REGENTS

With years of election

1892 William Croswell Doane D.D. LL.D. *Vice Chancellor*, Albany
1873 Martin I. Townsend M.A. LL.D. - - - Troy
1877 Chauncey M. Depew LL.D. - - - New York
1877 Charles E. Fitch LL.B. M.A. L.H.D. - - Rochester
1878 Whitelaw Reid M.A. LL.D. - - - New York
1881 William H. Watson M.A. LL.D. M.D. - - Utica
1881 Henry E. Turner LL.D. - - - - Lowville
1883 St Clair McKelway M.A. L.H.D. LL.D. D.C.L. Brooklyn
1885 Daniel Beach Ph.D. LL.D. - - - Watkins
1888 Carroll E. Smith LL.D. - - - - Syracuse
1890 Pliny T. Sexton LL.D. - - - - Palmyra
1890 T. Guilford Smith M.A. C.E. LL.D. - - Buffalo
1893 Lewis A. Stimson B.A. LL.D. M.D. - - New York
1895 Albert Vander Veer Ph.D. M.D. - - - Albany
1895 Charles R. Skinner M.A. LL.D. Superintendent of Public Instruction, ex officio
1897 Chester S. Lord M.A. LL.D. - - - - Brooklyn
1897 Timothy L. Woodruff M.A. Lieutenant Governor, ex officio
1899 John T. McDonough LL.B. LL.D. Secretary of State, ex officio
1900 Thomas A. Hendrick M.A. LL.D. - - - Rochester
1901 Benjamin B. Odell jr LL.D. Governor, ex officio
1901 Robert C. Pruyn M.A. - - - - - Albany
1902 William Nottingham M.A. Ph.D. - - - Syracuse
One vacancy

SECRETARY

Elected by Regents

1900 James Russell Parsons jr M.A. LL.D.

DIRECTORS OF DEPARTMENTS

1888 Melvil Dewey M.A. LL.D. *State Library and Home Education*
1890 James Russell Parsons jr M.A. LL.D. *Administrative, College and High School Dep'ts*
1890 Frederick J. H. Merrill Ph.D. State Museum

CONTENTS

English language and literature

PAGE
Spelling 5
English, elementary 11
" advanced 17
" 1st year 25
" 2d " 29
" 3d " 33
" composition 36
Advanced English composition 46
Rhetoric 50
History of literature 58
English reading 62
" selections 66
American selections 70

Foreign language

French, 1st year 73
" 2d " 79
" 3d " 83
German, 1st year 87
" 2d " 97
" 3d " 103
Spanish, 1st year 107
" 2d " 111
" 3d " 115
Greek, 1st year 119
Xenephon's Anabasis 123
Homer's Iliad 129
Greek, 2d year 133
" 3d " 137
" prose composition 141
Latin, 1st year 143
Caesar's Commentaries 153
Sallust's Catiline 161
Cicero's Orations 165
Virgil's Aeneid 171
" Eclogues 177
Latin, 2d year 181
" 3d " 185
" prose composition 189

Mathematics

PAGE
Arithmetic 191
" advanced 195
Algebra 197
" advanced 202
Plane geometry 204
Solid " 209
Trigonometry 211

Science

Astronomy 213
Physics 215
Chemistry 223
Geology 227
Physical geography 229
Botany 233
Zoology 236
Physiology and hygiene 238

History and social sciences

Geography 242
Greek history 245
Roman " 247
Medieval history 250
English " 252
Elementary U. S. history and civics 256
Advanced U. S. history 260
Civics 266
Economics 270

Other studies

Psychology 274
Ethics 276
Stenography 277
Bookkeeping 293
Drawing 301
" 309
Word analysis 313

PREFACE

Academic examinations. These tests are purely voluntary. The last vestige of compulsion regarding them disappeared when they ceased to be used as a means for the distribution of public funds. They are based on the *Academic Syllabus,* which is revised every five years with the assistance of specialists and with suggestions from principals and teachers. All question papers are prepared by specialists and are passed on by a question board of inspectors who are college graduates with experience in teaching and are, through frequent visits, in direct contact with the schools. With each set of question papers sent to the schools is inclosed a blank for criticisms by principals and teachers. By this means each question paper is reviewed by hundreds of teachers and the detailed criticism received is heeded in the preparation of later question papers.

Answer papers are rated first by the principals of the schools and those claimed are then sent to the University for review. In 1901 538,833 answer papers were written, of which number 353,939 or 66% were allowed. 57,100 papers, all of which except those of professional students had been rated by principals and teachers as entitled to 75%, were rejected on review. Since 1889 the per cent of claimed answer papers allowed by the University on review has not fallen below 86 or been greater than 92. All question papers are printed at the office of the Regents, are sent to the schools in steel boxes through the money order department of the express companies, and are most carefully guarded in every way.

JAMES RUSSELL PARSONS JR
Director High School Department

High School Department

172D EXAMINATION

SPELLING

Friday, January 31, 1902 — 1.15 to 2.15 p. m., only

The following numbered words are to be written by each candidate. The examiner should distinctly and properly pronounce each word (with its number prefixed), allowing sufficient time for writing it before the next word is pronounced. Papers entitled to 75 or more credits will be accepted.

When five army (1) transports (2) loaded with (3) nearly (4) fifteen (5) hundred (6) teachers of the (7) public (8) schools in (9) Cuba sailed into (10) Boston (11) harbor, it was an (12) event (13) which had no (14) parallel. It (15) directed the (16) attention of the (17) people of the United States, as (18) probably nothing (19) else (20) could, to the (21) progress of education among the people of the West Indian (22) island.

This (23) bringing of so many teachers of Cuba, is looked upon as the (24) greatest idea ever (25) conceived by the (26) superintendent of public (27) instruction in Cuba, and it has (28) brought him, (29) young as he is, no small (30) distinction in the (31) educational (32) world.

(33) Harvard university was the Mecca of (34) these (35) pilgrims in (36) search of (37) learning. All the (38) resources of the great (39) university were (40) thrown open to these young men and (41) women who were so (42) anxious to learn (43) themselves that they might teach others. If the (44) tuition had been paid for, it would have cost two hundred (45) thousand (46) dollars. If this was (47) added to the cost of (48) transportation, (49) maintenance, and to other (50) expenditures, the (51) total would be not far from a (52) million dollars. But it cost the teachers not a (53) penny save what they (54) chose to spend . . .

The (55) courses in (56) history and (57) government, (58) principles of (59) design, (60) astronomy, (61) geometry, (62) engineering, physics, (63) chemistry, (64) botany, (65) geology and (66) physical (67) training were open to them, and (68) special courses were (69) prepared in (70) English, history, (71) geography, school (72) organization and (73) management, and (74) general (75) culture.

The (76) broadening (77) effect of (78) personal observation and (79) tours in the (80) observatories, (81) museums and parks, the (82) contact with (83) daily (84) American life, the (85) intelligence gained by (86) noting our (87) civic (88) institutions, are among the most (89) valuable (90) influences of the trip, while the (91) splendid (92) generosity and public (93) spirit (94) shown by the university and (95) citizens of Boston and Cambridge in thus (96) offering the finest gifts (97) within (98) their (99) power, can not fail to do (100) lasting good.

—*Mary C. Francis*

High School Department

172D EXAMINATION

SPELLING

Wednesday, January 29, 1902—4.15 to 5.15 p. m., only

The following numbered words are to be written by each candidate. The examiner should distinctly and properly pronounce each word (with its number prefixed), allowing sufficient time for writing it before the next word is pronounced. Papers entitled to 75 or more credits will be accepted.

If, in this age of (1) science and (2) invention, there was to be (3) prepared a (4) revised (5) category of the (6) wonders of the world, the first place would (7) unquestionably have to be (8) accorded to the (9) marvelous (10) process (11) whereby the most (12) valuable of the (13) earth's (14) deposits is (15) transformed into iron and (16) steel (17) products for everyday use. It is safe to (18) presume that those (19) persons who (20) account the (21) present (22) era (23) devoid of (24) romance know little of the (25) intensely (26) picturesque and (27) dramatic (28) features which (29) characterize the (30) evolution of the (31) metal which is far more (32) indispensable than gold to the world's (33) welfare.

No (34) adequate (35) idea of the (36) tremendous (37) scope of the (38) iron (39) industry is (40) conveyed by the (41) simple (42) statement that the United States (43) produces (44) fully one (45) fourth more iron than any (46) other (47) nation; but the fact that the (48) annual (49) consumption of iron in Uncle Sam's (50) domain is on the (51) basis of (52) several (53) hundred pounds a year for each (54) inhabitant, (55) whereas in many (56) European (57) countries it does not (58) reach (59) fifty pounds (60) perhaps (61) indicates in a (62) slight (63) degree what an (64) immense (65) proportion of our (66) population looks to this (67) commonplace (68) commodity for the (69) necessities and (70) luxuries of life. (71) Statisticians who have taken the (72) trouble to make (73) careful (74) computations on the (75) subject have (76) figured out that one in (77) every (78) fourteen persons in the country is (79) dependent upon the iron industry for (80) support, which is (81) equivalent to (82) saying that if all the ironworkers and their (83) families were (84) gathered (85) together, they would form a (86) community (87) considerably (88) larger than Greater New York and its (89) environs.

There are so many (90) amazing things (91) connected with the work of (92) taking from the ground the (93) ore which looks for all the world like rich red earth, and (94) eventually working it up into every (95) imaginable form, from the teakettles to (96) locomotives, that to put your finger on any one (97) phase of the (98) transformation and say, "This is the *most* (99) surprising," is next to (100) impossible.

—*Waldon Fawcett*

University of the State of New York

High School Department

173D EXAMINATION

SPELLING

Wednesday, March 26, 1902 — 1.15 to 2.15 p. m., only

The following numbered words are to be written by each candidate. The examiner should distinctly and properly pronounce each word (with its number prefixed), allowing sufficient time for writing it before the next word is pronounced. Papers entitled to 75 or more credits will be accepted.

A (1) regiment in (2) Germany is (3) never made up (4) entirely of new men. In the first place, (5) there is the (6) skeleton (7) framework of the non-commissioned (8) officers (I am not (9) considering here the (10) commissioned officers), and (11) usually a large (12) residue of men who have (13) already (14) served one year. To these the new (15) draft, (16) awkward, callow, (17) apparently (18) hopelessly (19) stupid, is (20) added; and the officers are (21) confronted with the (22) discouraging task, as old as (23) armies, of (24) beating this raw (25) material into (26) shape. The new (27) recruit spends his first few weeks (28) pretty (29) closely in (30) barracks. His old (31) suit of (32) clothes is (33) packed up, (34) labeled, and (35) stored away, to be kept and (36) returned to him when he (37) finishes his (38) service. He is (39) fitted from (40) among the (41) oldest (42) uniforms in the (43) possession of the regiment, and he is set to such (44) dispiriting (45) tasks as (46) cleaning barracks, (47) blacking the officers' boots, and other (48) duties (49) quite as (50) disagreeable. To a boy who has been (51) brought up in (52) fairly good (53) surroundings, such tasks as these are (54) anything but a (55) pleasant (56) introduction to (57) military life; but here comes in the (58) national (59) spirit of (60) order and (61) obedience to (62) authority, and he obeys. The (63) greatest man in the (64) world to him just now is his (65) corporal, whose (66) business it is to (67) knock off his (68) rough (69) corners. His (70) first (71) sergeant, the (72) "mother of the regiment," is a (73) planet as yet a little out of his (74) orbit, and his (75) captain is a (76) fixed and (77) distant star to be looked upon with (78) awe and (79) wonder. One of his first duties is to learn the (80) soldier marks — the (81) distinguishing uniform of his officers and how he must (82) salute his (83) superiors. In Germany, the code of (84) etiquette, as (85) between officers and men, is very (86) rigid. The (87) private is (88) taught that he must obey (89) every order of a superior (90) absolutely and (91) unquestioningly, and that he must (92) invariably salute in (93) exactly the (94) proper way. A (95) sentinel comes to (96) "present arms" and (97) follows his officer with his eyes, like a (98) faithful dog, (99) until he is out of (100) sight.—*Baker*

High School Department

173D EXAMINATION

SPELLING

Monday, March 24, 1902—4.15 to 5.15 p. m., only

The following numbered words are to be written by each candidate. The examiner should distinctly and properly pronounce each word (with its number prefixed), allowing sufficient time for writing it before the next word is pronounced. Papers entitled to 75 or more credits will be accepted.

(1) Before (2) endeavoring to (3) trace the (4) course of (5) recent (6) events in China with the (7) purpose of (8) throwing some (9) light on the (10) present (11) situation, I must (12) point out what is the most (13) dangerous (14) feature of the revolution with which we are now (15) brought face to face. Two years ago, any (16) naval or army (17) officer would have (18) staked his life and (19) reputation upon (20) getting into Pekin from Tientsin with but five (21) hundred (22) Europeans or (23) Americans (24) behind him, all the (25) military (26) forces of the Chinese (27) empire (28) notwithstanding. (29) Admiral Seymour, a (30) gallant and (31) resolute officer, has, with a (32) column of (33) nearly three (34) thousand (35) picked men, not only (36) failed to (37) reach the (38) capital, but been (39) driven back with (40) considerable (41) loss to his (42) base, after (43) having been cut off from all (44) communication with it for nearly ten days. The (45) relief column was (46) composed of the best (47) material; and in Captain McCalla, Admiral Seymour had a (48) lieutenant (49) second to (50) none. These gallant (51) sailors and (52) marines (53) carried with them a (54) number of field-guns, and they were (55) spurred on to the most (56) determined (57) effort by the news of the (58) desperate (59) straits to which the (60) occupants of the (61) legations in Pekin had been (62) reduced by the (63) besieging (64) revolutionists; and yet, after (65) narrowly (66) escaping a (67) disaster, the relief column (68) retreated upon Tientsin. The (69) conclusion is forced upon us that they failed (70) because they met (71) Chinese (72) soldiery of very (73) different (74) caliber from what they had (75) expected, with (76) every (77) reason, to meet; and it is this feature of the situation which I must (78) dwell upon as being more (79) alarming than the (80) actual news from Pekin, (81) unpleasant to read as that is. (82) Travelers from the west (83) generally (84) disagree upon every Chinese (85) question save one. They have been (86) unanimous in (87) pronouncing the Chinese army as (88) worthless, and in (89) holding its (90) organization up to (91) contempt. It is true, (92) however, that some of the (93) foreign officers who have been (94) intrusted with the (95) education of Chinese (96) recruits, have in some (97) measure (98) dissented from this (99) sweeping (100) opinion.—*Stephen Bonsal*

High School Department

174TH EXAMINATION

SPELLING

Friday, June 20, 1902—1.15 to 2.15 p. m., only

The following numbered words are to be written by each candidate. The examiner should distinctly and properly pronounce each word (with its number prefixed), allowing sufficient time for writing it before the next word is pronounced. Papers entitled to 75 or more credits will be accepted.

The (1) movement (2) directed (3) toward the (4) beautifying of (5) public schoolhouses, which is (6) becoming more and more (7) marked, is one of the most (8) important that has taken place in (9) connection with the (10) cause of (11) education in (12) America. The (13) architectural beauty and (14) dignity of (15) certain schoolbuildings (16) erected not (17) only in the larger (18) cities but even in the small (19) townships, have (20) recently been (21) noticeable. Where (22) nothing has yet been done (23) tending to (24) improve upon the old time schoolhouse, it is at (25) least (26) freely (27) admitted in (28) principle that a school should be outwardly (29) acceptable to the eye. It is also admitted that it should, (30) whenever (31) possible, be (32) inwardly (33) adorned, with (34) reproductions—(35) casts, (36) engravings, fine (37) photographs—of beautiful things: the masterpieces of architecture, (38) painting, (39) sculpture. The (40) significance of all this lies in the (41) recognition it (42) implies of a fact that (43) hitherto has (44) received little or no (45) practical (46) acknowledgment in our American life. We have always acted as if we (47) assumed that the (48) sense of the beautiful could be (49) acquired as some (50) persons acquire (51) wealth, as some (52) others get (53) learning; that it could be (54) obtained by (55) putting (56) forth will power and (57) taking an (58) industrious (59) interest in the (60) subject. But the (61) present (62) effort, to make the schoolbuilding a place that shall (63) exert an (64) enlightening (65) influence on the esthetic (66) nature of the most (67) youthful (68) scholar, shows a (69) growing (70) understanding that the love and the (71) perception of beauty do not come to any one (72) merely by (73) willing that they shall. (74) Reading, (75) study, (76) observation, a (77) sincere (78) desire for (79) communion with the beautiful, may (80) deepen, (81) intensify, and (82) illuminate such love and perception. But the (83) essence, the (84) germ, of them, to be truly (85) vital, must have been (86) built into the (87) constitution before there was any (88) conscious (89) exercise whatever of the will with (90) regard to them. If the (91) appropriate means of (92) cultivation be brought to bear soon (93) enough, a child who has in any (94) degree the (95) right gifts comes to feel (96) confusedly what beauty is, and has his (97) imagination and his (98) emotions (99) enlarged and (100) uplifted.

High School Department

174TH EXAMINATION

SPELLING

Wednesday, June 18, 1902—4.15 to 5.15 p. m., only

The following numbered words are to be written by each candidate. The examiner should distinctly and properly pronounce each word (with its number prefixed), allowing sufficient time for writing it before the next word is pronounced. Papers entitled to 75 or more credits will be accepted.

The (1) science of linguistics is among the (2) youngest, and yet it has (3) already (4) established (5) itself so (6) firmly on the solid ground of (7) ascertained truth that it has been able to (8) overthrow with (9) ease one and (10) another of the (11) theories which were (12) accepted (13) without (14) question before it came into being.

For (15) example, time was—and the time is not so very (16) remote, it may be (17) remarked—time was when the little (18) group of more or less (19) highly (20) educated men, who were at the (21) center of (22) authority in the (23) capital of any (24) nation, had no (25) doubt (26) whatsoever as to the (27) superiority of (28) their way of (29) speaking their own (30) language over the (31) manner in which it might be (32) spoken by the (33) vast (34) majority of their fellow (35) citizens (36) deprived of the (37) advantages of a (38) court (39) training. This little group set the (40) standard of (41) speech; and the standard they set was accepted as (42) final and not to be (43) tampered with under (44) penalty of (45) punishment. They held that any (46) divergence from the (47) customs of speaking and writing they (48) themselves (49) cherished was (50) due to (51) ignorance, and (52) probably to (53) obstinacy. They (54) believed that the court (55) dialect which they had been (56) brought up to use was the only true and (57) original form of the language; and they (58) swiftly (59) stigmatized as a (60) gross (61) impropriety every (62) usage and every (63) phrase with which they themselves did not (64) happen to be (65) familiar. In thus (66) maintaining the (67) sole (68) validity of their (69) personal (70) habits of speech, they had no need for self-assertion, since it never (71) entered into the head of anyone not (72) belonging to the court (73) circle to (74) disparage for a (75) second the (76) position thus (77) tacitly (78) declared.

If (79) modern (80) methods of (81) research have made (82) anything whatever (83) indisputable in the (84) history of (85) human speech, they have (86) completely (87) disproved the (88) assumption which (89) underlies this (90) implicit claim of the (91) courtiers . . . (92) Generally it is the (93) stability given by (94) political (95) preeminence (96) which leads to the (97) development of a (98) literature, without which no dialect *can (99)* retain its linguistic (100) supremacy.

— *Brander Matthews*

University of the State of New York

High School Department

172D EXAMINATION

ELEMENTARY ENGLISH

Friday, January 31, 1902—9.15 a. m. to 12.15 p. m., only

Answer questions 11-12 and six of the others but **no more.** *If more than six of the others are answered only the first six answers will be considered. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

1 Analyze by diagram or otherwise the following sentence: The favorite position of the deer is still spirited and graceful, and wholly unaffected by the pictures of him which the artists have put upon canvas.

2 Write sentences containing *a*) the nominative plural of *thief*, *b*) the possessive singular of *negro*, *c*) the possessive plural of *man*, *d*) an abstract noun derived from an adjective, *e*) an adverb of manner.

3 Write a letter to a cousin whom you have never seen, inviting him to visit you on Washington's birthday and stating how you have planned to entertain him.

4 Give the part of speech and the syntax of *each* of the italicized words in the following: *a*) The frightened beast, *fleeing* from the unreasoning brutality of the hounds, will *often* seek the open country, *b*) She descended the slope of the mountain *until* she reached the *more* open *forest* of hard wood.

5 Select from the following the incorrect sentences and rewrite in correct form, giving the reason for each correction: *a*) I do not like these sort of men, *b*) The tramping of many feet were heard all day long, *c*) "Scamps" is what he said, *d*) Let you and me decide this, *e*) He is tall like his brother is, *f*) I do not know whom to expect, *g*) She and myself will visit you shortly.

6 Write the third person singular of *each* of the tenses of the indicative active of *bear*. Give the active infinitives and participles of *bear*. [State in each case the name of the tense.]

7 Combine the following statements into a simple sentence: The hermit was a good man. He was in his garden. He sat on a bench. The bench was under a tree. He held his prayer-book in his hand.

8 Write *a*) an exclamatory sentence containing an infinitive phrase, *b*) a compound imperative sentence, *c*) a complex sentence containing a noun clause.

9 Parse the italicized words in the following: *a*) New York, the Empire *state*, is *first* in the value of *its* commerce, *b*) George, bring your *sister* her book.

10 Explain the meaning of *five* of the italicized words in the following:

> *a* Down the long street she passed, with her chaplet of beads and
> her *missal*.
>
> *b* And a staircase,
> Under the sheltering *eaves*, led up to the *odorous* corn-loft.
>
> *c* Late, with the rising moon, returned the *wains* from the *marshes*.
>
> *d* Now, though *warier* grown, without all *guile* or suspicion,
> *Ripe* in wisdom was he.

11–12 Write an essay of at least 100 words on *one* of the following topics, paying special attention to spelling, capitalization, punctuation, grammatic construction, proper use of words and sentence structure [Essays on subjects other than those assigned will not be accepted]:

a) Basil the herdsman [Give a description of Basil's Louisiana home and of his new occupation], *b*) Fellow-sufferers [Let Evangeline give an account of her meeting with the Shawnee woman and of their conversation about their disappointments].

NOTE—Pupils not familiar with *Evangeline* may write on *one* of the following: *a*) My baby brother, *b*) After school has been dismissed.

High School Department

173D EXAMINATION

ELEMENTARY ENGLISH

Wednesday, March 26, 1902—9.15 a. m. to 12.15 p. m., only

Answer questions 14-15 and eight of the others but **no more.** *If more than eight of the others are answered only the first eight answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Analyze by diagram or otherwise the following sentence:

For a quarter of an hour she went on, clearing the moose-bushes with bound after bound, flying over fallen logs, pausing for neither brook nor ravine.

2 Write sentences containing *a*) the possessive plural of *deer*, *b*) *since* used as a preposition, *c*) *still* used as an adjective, *d*, *e*) a proper noun used as the object of an infinitive and a noun in apposition with the proper noun.

3 Write a letter to a former schoolmate, describing an incident that occurred *either* during the holiday vacation *or* on Washington's birthday.

4 Parse the italicized words in the following: *a*, *b*) Every way *was closed* but *one*, *c*) At her first step into the water she saw a sight *that* sent her back with a bound, *d*) Had she *strength* to swim it?

5 Write the third person singular of *each* of the tenses of the indicative of *lie* (*to recline*), giving in each case the name of the tense. Write *four* infinitives of *lie*, giving the name of each.

6 Select from the following the incorrect sentences and rewrite in correct form, giving the reason for each correction: *a*) Neither John nor James know what is to be done, *b*) I do not know who to ask, *c*) I know who the boy is, *d*) I saw the change most as soon as I saw you, *e*) They divided the money between John and her, *f*) There was nobody here but myself, *g*) Will you let him and me see the painting?

7 Combine the following statements into a complex sentence:

The old man turned round. He turned slowly. He displayed a face of great dignity. His face was rendered doubly venerable by his hoary beard. His beard descended to his breast.

8 Give the part of speech and the syntax of *each* of the italicized words in the following: *a*, *b*) Even the swallow will fight the cat, *relying too* confidently on its powers of flight, *c*) It is because the shrike is a rare *visitant*, *d*) It is amusing to

see the robins hustle ***him*** out of the tree, *e*) The jay retorts in a voice scarcely less ***complimentary***.

9 Write *a*) an exclamatory sentence containing a participial phrase, *b*) a complex interrogative sentence, *c*) a compound declarative sentence containing an infinitive phrase.

10 Select from the following sentences a noun clause, an adjective clause and an adverbial clause, giving in each case the name of the clause: *a*) As I remained motionless, the weasel thrust out his wedge-shaped head, *b*) A troop of weasels tried to cross the barway where I sat, *c*) They ran along the top of the wall till they came to a floor timber that stopped their progress, *d*) I presume that these goats have no nonsense about them.

11 Write sentences illustrating *three* uses of the objective case and *two* uses of the nominative case, not including the subject nominative.

12 Explain the meaning of *five* of the italicized words in the following:

a Away to the northward
Blomidon rose.

b Loud and in regular *cadence*
Into the sounding pails the foaming streamlets descended.

c Behind him,
Nodding and mocking along the wall, with *gestures fantastic*,
Darted his own huge shadow.

d *Shocks* of yellow hair, like the silken floss of the ***maize***, hung
Over his shoulders.

e The blacksmith
Stood like a man who *fain* would speak, but findeth no language;
All his thoughts were *congealed* into lines on his face.

13 Give an account of Evangeline's journey with Basil in their search for Gabriel.

14–15 Write an essay of at least 100 words on *one* of the following topics, paying special attention to spelling, capitalization, punctuation, grammatic construction, proper use of words and sentence structure [Essays on subjects other than those assigned will not be accepted]: *a*) An unwelcome proclamation [Give an account of the royal commission delivered by the commander of the guards, and describe its effect on the people in the church], *b*) A home with the Quakers [Describe the life of Evangeline in her home among the children of Penn].

NOTE—Pupils not familiar with *Evangeline* may write on ***one*** of the following: *a*) The Hudson river, *b*) A day in the country.

University of the State of New York

High School Department

174TH EXAMINATION

ELEMENTARY ENGLISH

Friday, June 20, 1902—9.15 a. m. to 12.15 p. m., only

Answer questions 14-15 and eight of the others but no more. *If more than eight of the others are answered only the first eight answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Analyze by diagram or otherwise the following sentence:

The sole companion of the doe *was* her *only* child, a charming little *fawn*, *whose* brown coat was mottled with beautiful spots.

2 Parse, from the quotation in question 1, *was* (line 1), *only*, *fawn*, *whose*.

3 Write sentences illustrating the use of *few* as (*a*) an adjective, (*b*) an adjective pronoun (indefinite pronoun); *that* as (*a*) an adjective, (*b*) a relative pronoun; *well* as (*a*) an adjective, (*b*) an adverb.

4 Assume that you have received a formal invitation from Miss Collier to dine with her. Write your acceptance or regrets.

5 Write original sentences showing the difference between (*a*) a participial adjective and a participle, (*b*) a personal pronoun and an interrogative pronoun, (*c*) an adverb and an adverbial phrase.

6 Parse the italicized words in the following: (*a*) I have never seen them scold or molest *him*, (*b*) The shrike *is found* in this part of the country, (*c*) I have not proof *enough* to convict him, (*d*) The nest of a chickadee was broken up in a position where nothing but a *mouse* could have reached it.

7 Select from the following the incorrect sentences and rewrite in correct form, giving the reason for each correction: (*a*) My book is different from yours, (*b*) Are either of these girls your friend? (*c*) He had lain down just before we arrived, (*d*) It was her who said that we might go, (*e*) Which of all the books do you think is the better? (*f*) Who do you think I met on the train? (*g*) The teacher, not her pupils, wants a vacation at this time.

8 Combine the following statements into a complex sentence:

He had just raised the cup to his lips. His eyes fell on a poor soldier. The soldier was dying. The soldier was looking longingly at the drink. The drink was cool.

9 Write sentences containing (*a*) the indicative, past (imperfect) of *go*, (*b*) the passive, indicative, past perfect (pluperfect) of *break*, (*c*) the active, progressive, indicative, future of *do*, (*d*) the emphatic, past (imperfect) of *say*, (*e*) the passive, indicative, present perfect (perfect) of *see*.

10 Give the part of speech and the syntax of *each* of the italicized words in the following: (*a*) Its little body was hot and *panting* in my hands, (*b*) Certain birds *nest* in the vicinity of our houses, (*c*) Weasels might have robbed the nest, *as* they sometimes climb trees, (*d*) The birds were *much* disturbed by the event, (*e*) He is seized with an *itching* for a collection of eggs and birds.

11 Write a compound sentence containing one complex member; a complex sentence containing an infinitive phrase; an imperative sentence and change it to an interrogative sentence.

12 Explain the meaning of *five* of the italicized words in the following:

a Anon from the *belfry*
Softly the *angelus* sounded.

b Under the sycamore-tree were hives overhung by a *penthouse*.

c Oft on sledges in winter, as swift as the *swoop* of the eagle,
Down the hillside bounding, they glided away o'er the meadow.
Oft in the barns they climbed to the *populous* nests on the rafters.

d Birds of passage *sailed* through the *leaden* air.

e Wild with the winds of September
Wrestled the trees of the forest.

13 Describe the village of Grand-Pré and the manner of life of the inhabitants.

14–15 Write an essay of at least 100 words on *one* of the following topics, paying special attention to spelling, capitalization, punctuation, grammatic construction, proper use of words and sentence structure [Essays on subjects other than those assigned will not be accepted]:

(*a*) Weary Waiting [Give an account of what Evangeline did from the time of the service in the church till her meeting with her father], (*b*) A pleasant Reunion [When Basil and Evangeline meet in Louisiana, let them relate to each other what has happened to each since their separation in Acadia].

NOTE—Pupils not familiar with *Evangeline* may write on *one* of the following: (*a*) An attractive School-room, (*b*) How I caught my first Fish.

High School Department

171ST EXAMINATION

ADVANCED ENGLISH

Tuesday, September 24, 1901 — 1.15 to 4.15 p. m., only

Answer three of the first five questions, 11–12, and three of the others but **no more.** *If more than three of the others are answered only the first three answers will be considered. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

1 Perhaps it might be owing to the pleasing serenity that reigned in my own mind, that I fancied I saw cheerfulness in every countenance throughout the journey.

Write out each clause in the above quotation, state the kind of clause and give the syntax of each subordinate clause (not of the words within the clause).

2 His reasoning was cogent, and I must confess the *preparation* I *had seen* for *universal* festivity and social enjoyment had made me *feel* a little *impatient* of my loneliness.

Parse, from the above quotation, *preparation*, *had seen*, *universal*, *feel*, *impatient*.

3 Write sentences containing infinitive phrases used in *three* of the following ways: *a*) as an independent element, *b*) as object of a preposition, *c*) as subject of a verb, *d*) as an adjective modifier, *e*) as an adverb modifier.

4 Give the syntax of the italicized words in the following sentences: *a*) At first its voice was very hoarse and broken, *being troubled* by a cobweb, *b*) Those few owe their longevity to *being immured* like yourself in old libraries, *c*) Excuse my *interrupting* you, but I perceive you are rather given to prose, *d*) The place seemed *fitted* for quiet study and profound meditation.

5 Give the syntax of the subordinate clauses in the following sentences: *a*) I shall endeavor, as far as I am able, to render it in modern parlance, *b*, *c*) Had you been left to the circulation of which you speak, you would long ere this have been no more, *d*, *e*) I should observe that these remarks were couched in such intolerably antiquated terms, that I have had infinite difficulty in rendering them into modern phraseology.

6 Select from the following the incorrect sentences and rewrite in correct form, giving the reason for each correction: *a*) The Mississippi is larger than any river in North America,

b) The highlander, who Fitz-James noticed was acting suspiciously, uttered a cry and fled, *c*) He, who had known her since she was a little child, she now saw turn coldly away from her, *d*) Honesty with perseverance are the paths to success, *e*) Neither a tyrant nor an anarchist can depend on his followers, *f*) He knew the new-comer to be her, *g*) Coming up over the ridge, the whole valley can be seen.

7 Write sentences containing *three* of the following: *a*) *but* used as a preposition, *b*) *only* modifying a phrase, *c*) an adverbial clause of purpose, *d*) *where* introducing an adjective clause, *e*) *that* introducing a noun clause.

8 Write a letter to a college or professional school, asking for information in regard to entrance requirements.

9 Give an account of the demand made by Roderick for the hand of Ellen, and describe the immediate results.

10 Explain the meaning of *five* of the italicized words in the following:

a The *falcon*, from her *cairn* on high,
Cast on the *rout* a *wondering* eye.

b For the death-wound and *death-halloo*
Mustered his breath, his *whinyard* drew.

c And on the hunter *hied* his way.

11–12 Write an essay of at least 150 words on *one* of the following topics, paying special attention to spelling, punctuation, grammatic construction and proper use of words; also some attention to introduction, proper grouping of ideas into paragraphs and pleasant transition between sentences [Essays on subjects other than those assigned will not be accepted]:

a) National peculiarities, *b*) A hard-earned dollar.

High School Department

172D EXAMINATION

ADVANCED ENGLISH

Monday, January 27, 1902 — 1.15 to 4.15 p. m., only

Answer three of the first five questions, 11–12, and three of the others but **no more.** *If more than three of the others are answered only the first three answers will be considered. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

1 I would have a rule passed that the dean should pay each of us a visit at least once a year; or if he is not equal to the task, let them once in a while turn loose the whole school of Westminster among us, that at any rate we may now and then have an airing.

Select, from the above quotation, the subordinate clauses and give the syntax of each clause selected (not of the words within the clause).

2 I had three fine rosy-cheeked boys for my fellow-passengers *inside, full* of the buxom health and manly spirit which I have observed in the children of this country. They *were returning home for the holidays.*

Parse, from the above quotation, *inside, full, were returning, home.* Give the syntax of the phrase *for the holidays.*

3 Write sentences containing *three* of the following: *a*) an adverbial clause of degree, *b*) a noun clause used as subject of a verb, *c*) an adverbial clause of cause, *d*) an adverbial clause of place modifying the object of a preposition, *e*) an adverbial clause of concession.

4 Parse the italicized words in the following: *a, b*) These *all* look up to him *as* to an oracle, *c, d, e*) *Perhaps* the impending holiday *might have given* a *more* than usual animation to the country.

5 Change the italicized phrases in the following to subordinate clauses, and give the syntax of each subordinate clause thus formed: *a*) He finds the language in which he has embarked his fame *gradually altering*, *b*) He is always a personage full of mighty care and business, but he is particularly so during this season, having so many commissions *to execute*, *c*) I was pleased *to see the fondness* with which the little fellows leaped about the steady old footman.

6 Select from the following the incorrect sentences and rewrite in correct form, giving the reason for each correction: *a*) The right and wrong way are open to everybody, *b*) I should

not have let him done it, *c*) No haste and no delay is to be tolerated in an affair like this, *d*) This is the result of nothing else besides your good nature, *e*) More persons than he were witnesses of the act, *f*) Let her be whom she may, I do not care, *g*) Two such forces destroy each other.

7 Combine the following statements into a complex sentence, changing the third and fourth statements to a clause of concession and the fifth statement to a clause of result (consequence):

The furniture was of the workmanship of former days. The workmanship was cumbrous. Some articles of modern convenience had been added. The oaken floor had been carpeted. The whole presented an odd mixture of parlor and hall.

8 Write a letter of congratulation to a friend who has recently been appointed to a position of importance.

9 Describe the experiences of Fitz-James while he was being guided to Coilantogle ford by Roderick Dhu.

10 Explain the meaning of *five* of the italicized words in the following:

a The antlered monarch of the *waste*
Sprung from his *heathery* couch in haste.
But ere his fleet *career* he took,
The dew-drops from his flanks he shook;
Like *crested* leader proud and high
Tossed his *beamed frontlet* to the sky;
A moment gazed adown the dale,
A moment snuffed the *tainted* gale.

b With one brave bound the *copse* he cleared.

11–12 Write an essay of at least 150 words on *one* of the following topics, paying special attention to spelling, punctuation, grammatic construction and proper use of words; also some attention to introduction, proper grouping of ideas into paragraphs and pleasant transition between sentences [Essays on subjects other than those assigned will not be accepted]:

a) An outlawed earl [Let Ellen tell the story of the adventures of Douglas], *b*) The battle of Beal' an Duine [Give an account of the battle between Clan-Alpine and the Saxon forces as described by Allan Bane].

NOTE—Students not familiar with *Lady of the lake* may write on *one* of the following: *a*) A winter evening, *b*) What the school clock sees.

High School Department

173D EXAMINATION

ADVANCED ENGLISH

Monday, March 24, 1902 — 1.15 to 4.15 p. m., only

Answer questions 13–15 and seven of the others but **no more,** *including at least three from the first five. If more than seven of the others are answered only the first seven answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Select from the following quotation *a*) an adjective clause, *b*) a noun clause, *c*) an adverbial clause; give the syntax of each clause selected (not of the words within the clause):

The little quarto *began* to heave his sides and *chuckle*, until *at length* he broke out in a plethoric fit of laughter that had well-nigh choked him, by reason of his excessive corpulency. "Mighty well!" cried he, as *soon* as he could recover his breath, "mighty well! and so you would persuade me that the literature of an age is *to be perpetuated* by a vagabond deer-stealer!"

2 Parse, from the quotation in question 1, *began*, *chuckle*, *soon*. Give the syntax of the phrases *at length*, *to be perpetuated*.

3 Write sentences containing phrases denoting *three* of the following: *a*) agency, *b*) limit of motion, *c*) place in which, *d*) instrument or means, *e*) accompaniment.

4 Give, from the following quotation, the part of speech and the syntax of *which* (line 2), *pony*, *according to*, *possessed;* give the syntax of the phrase *to which:*

The meeting *to which* they seemed to look forward with the greatest impatience was with Bantam, *which* I found to be a *pony*, and, *according to* their talk, *possessed* of more virtues than any steed since the days of Bucephalus.

5 Write sentences illustrating the following adjective relations: attributive, appositive, predicate.

6 Combine the following statements into a single sentence containing a participial phrase:

Toward noon she saw an elderly gentleman. He was large and portly. He was of remarkably dignified demeanor. He passed slowly along the opposite side of the street. The street was dusty.

7 Select from the following the incorrect sentences and rewrite in correct form, giving the reason for each correction: *a*) Not only his neighbors condemned him, but his relatives condemned him also, *b*) I was sure that it was she, *c*) I knew it to be he as soon as I saw him, *d*) He would have corrected

the paper if you desired, *e*) The news of his arrival was a surprise to the family, *f*) I intended to go but he said that it would not be necessary, *g*) By observing of the directions that I have given you, you will easily find the way.

8 Write a letter to a business man in New York city, applying for a position. Give all necessary information regarding yourself.

9 Give the syntax of the italicized words in the following sentences: *a*) I rode a long distance on the day *preceding* Christmas, *b*) Instead of *reading*, however, I was beguiled by the solemn monastic air, *c*, *d*) Before long a man of erudition will be *little* better than a mere walking *catalogue*, *e*) They were promising *themselves* a world of enjoyment.

10 Change the subordinate clauses in the following sentences to infinitive or participial phrases and give the syntax of each phrase thus formed: *a*) My brother who was impressed with the beauty of the scenery decided to remain, *b*) The pilot went to the wheel that he might take the management of the ship, *c*) Arnold was afraid that he might be detected in his treason.

11 Describe the preparation and the consecration of the fiery cross.

12 Explain the meaning of *five* of the italicized words in the following:

a Alone, but with *unbated* zeal,
That horseman plied the *scourge* and *steel.*

b He told of his *benighted* road.

c He saw your steed, a *dappled* gray,
Lie dead beneath the *birchen* way;
Painted exact your form and *mien.*

d Yet the lark's shrill *fife* may come.

13–15 Write an essay of at least 150 words on *one* of the following topics, paying special attention to spelling, punctuation, grammatic construction and proper use of words; also some attention to introduction, proper grouping of ideas into paragraphs and pleasant transition between sentences [Essays on subjects other than those assigned will not be accepted]:

a) The adventures of a hunter [Give an account of the day of the chase up to the time of the meeting of Fitz-James and Ellen], *b*) The victor of the day [Let Douglas describe to Ellen his arrival at Stirling castle and the part he took in the sports].

NOTE—Students not familiar with *Lady of the lake* may **write on *one*** of the following: *a*) The first signs of spring, *b*) A profitable **afternoon.**

University of the State of New York

High School Department

174TH EXAMINATION

ADVANCED ENGLISH

Monday, June 16, 1902 — 1.15 to 4.15 p. m., only

Answer questions 13-15 and seven of the others but no more, *including at least three from the first five. If more than seven of the others are answered only the first seven answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Select from the following quotation *three* subordinate clauses, and give the classification (subdivision if adverbial) and the syntax of each clause selected:

> "My very good *sir*," said the little quarto, yawning most drearily in my face, "*excuse my* interrupting you, but I perceive you are rather given to prose. I would ask the *fate* of an author who was making some noise just as I left the world. His reputation, however, was considered *quite* temporary."

2 Parse, from the quotation in question 1, *sir*, *excuse*, *my* (line 2), *fate*, *quite.*

3 Write a sentence containing a nominative absolute (absolute phrase) and change the nominative absolute to a clause of cause; a sentence containing a participial phrase and change the participial phrase to a clause of time; a sentence containing an infinitive phrase and change the infinitive phrase to a noun clause.

4 In the following sentences classify the adjectives as appositive, attributive or predicate: (*a*) With the true poet everything is terse, (*b*) They have a dress, a manner, peculiar to themselves, (*c*) He conducted me through a portal rich with the sculpture of former ages, (*d*) The worthy little tome was silent, (*e*) The passing of the coach is an event fruitful of much speculation.

5 Select from the following italicized phrases, a phrase denoting place from which, a phrase denoting agency, a phrase denoting instrument or means: (*a*) I was beguiled *by the solemn monastic air*, (*b*) The smith, *with the horse's heel* in his lap, pauses as the vehicle whirls by, (*c*) To have the title of their works read *by some drowsy churchman*, (*d*) You are like the treasured remains of those saints and monarchs which lie enshrined *in the adjoining chapels*, (*e*) I was intended to circulate *from hand* to hand.

6 Write a letter to a dry goods firm, inclosing a sample of goods that you wish to match. Order the goods, giving all necessary details.

7 Select from the following the incorrect sentences and rewrite in correct form, giving the reason for each correction: (*a*) These tools were manufactured for us but were seldom or

ever used, (*b*) The remark he made was that truth was beyond all price, (*c*) The humble cottage and the lordly castle each contributes a picture to the scene, (*d*) The signing of the contract gave great satisfaction, (*e*) This is the man's house who visited us last summer, (*f*) We met Mr Rouse whom all agree is very pleasant, (*g*) He saw a man whom he knew to be the keeper of the gate.

8 Combine the following statements into a single sentence containing but *one* adjective clause:

The cocoanut is a woody fruit. It is oval in shape. It is from three or four to six or eight inches in length. It is covered with a fibrous husk. The husk contains a kernel. This kernel is white, firm and fleshy.

9 Parse the italicized words in the following sentences: (*a*) You are talking of authors that lived *long* before my time, (*b*) The brilliancy and intrinsic value of the gems continue *unaltered*, (*c*) Books were written *to give* pleasure, (*d*, *e*) They take their stations there for the important purpose of *seeing* company *pass*.

10 A friend has written to ask you about a boarding-school which she thinks of attending next year. Write her an appropriate reply.

11 Explain how James Fitz-James happened to meet Ellen the first time and give in substance their conversation before they reached the island.

12 Explain the meaning of *five* of the italicized words in the following:

a Faint, and more faint, its failing din
Returned from cavern, cliff, and *linn*.

b Nor nearer might the dogs *attain*,
Nor farther might the *quarry* strain.

c O'er *stock* and rock their race they take.

d But still the *dingle's* hollow throat
Prolonged the *swelling* bugle-note.

e But, wave-encircled, seemed to float,
Like castle girdled with its *moat*.

f *Blithe* were it then to wander here!
But now—beshrew yon nimble deer!

13–15 Write an essay of at least 150 words on *one* of the following topics, paying special attention to spelling, punctuation, grammatic construction and proper use of words; also some attention to introduction, proper grouping of ideas into paragraphs and pleasant transition between sentences [Essays on subjects other than those assigned will not be accepted]:

(*a*) A faithful Minstrel [Let Ellen in after years relate the story of Allan Bane], (*b*) An eventful Evening [Give an account of the evening spent at the home of Roderick Dhu immediately before the gathering of the clans].

Note—Students not familiar with *Lady of the Lake* may write on *one* of *the following:* (*a*) Summer Sports, (*b*) A useful Book.

University of the State of New York

High School Department

172D EXAMINATION

ENGLISH—First Year

Monday, January 27, 1902—1.15 to 4.15 p. m., only

Answer eight questions but **no more,** *including at least four questions from the first division. If more than eight are answered only the first eight answers will be considered. Each complete answer will receive 12½ credits. The whole paper will be criticized as an exercise in English composition. Papers entitled to 75 or more credits will be accepted.*

First division

1 In *such* a mood I was loitering about the old gray cloisters of Westminster abbey, enjoying that luxury of wandering thought which one is *apt* to dignify *with the name* of reflection; when *suddenly* an interruption of madcap boys *from Westminster school,* playing at football, broke in upon the monastic stillness of the place, making the vaulted passages and moldering tombs echo with their merriment.

Select from the above quotation *a*) *two* subordinate clauses, *b*) *one* participial phrase. Give the syntax of the clauses and the phrase selected.

2 Parse, from the quotation in question 1, *such, apt, suddenly.* Give the syntax of the phrases *with the name, from Westminster school.*

3 Write sentences containing *three* of the following: *a*) *when* introducing a noun clause, *b*) *the* used as an adverb, *c*) *either* used as an adjective pronoun, *d*) a participial phrase used independently, *e*) a relative pronoun with the antecedent omitted.

4 Assume that you have been invited to meet a Miss Smith who is visiting one of your friends. Write a formal note of regret.

5 Give the syntax of *three* of the italicized infinitives in the following: *a*) He is said *to have written* nearly 200 volumes, *b, c*) *To reason* from analogy, we daily behold the varied and beautiful tribes of vegetables springing up, flourishing, adorning the fields for a short time, and then fading into dust, *to make* way for their successors, *d*) They have enabled every mind *to pour* itself into print, *e*) It was the verger, who came to inform me that it was time *to close* the library.

6 Select from the following the incorrect sentences and rewrite in correct form, giving the reason for each correction: *a*) One after another withdrew their opposition, *b*) The sole end and aim of his life is to get money, *c*) Passengers must not smoke on the platform or in any part of the car, *d*) I

thought he would perish several times, *e*) He told me that he would try to get the book, *f*) If fresh milk does not agree with the baby, boil it, *g*) Every one that has a purpose must succeed in the end.

Second division 7 Give, from the *Lady of the lake*, Brian's prophecy and describe the incident that, in your opinion, fulfils this prophecy.

8 Explain the meaning of *five* of the italicized words in the following:

a This is the sword of *Damascus* I fought with in *Flanders*.
b Truly the maxim is good, and I do not mean to *gainsay* it.
c As in a foundering ship, with every roll of the vessel,
Washes the *bitter* sea.
d Gayly, with joyous laugh, Priscilla mounted her *palfrey*.
"Nothing is wanting now," he said with a smile, "but the *distaff*."
e Down through the golden leaves the sun was *pouring* his splendors.
f Like a picture it seemed of the *primitive*, pastoral ages.

9 Describe, from *Snow-bound*, the experiences related by *a*) the father, *b*) the mother.

10 Describe the celebration of Christmas eve at Bracebridge Hall.

11 Give, from "Stratford-on-Avon," an account of the ramble through the park and mansion of the Lucy family.

12 Give, from *Ivanhoe*, a description of the scene in which Isaac delivers Prior Aymer's letter to the Grand Master.

High School Department

174TH EXAMINATION

ENGLISH—First Year

Monday, June 16, 1902—1.15 to 4.15 p. m., only

Answer 10 questions but **no more,** *including at least five questions from the first division. If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. The whole paper will be criticized as an exercise in English composition. Papers entitled to 75 or more credits will be accepted.*

First division

1 Select from the following quotation *three* subordinate clauses, and give the classification (subdivision if adverbial) and the syntax of each clause selected:

I looked after them with a feeling *in which* I do not know *whether* pleasure or melancholy predominated; for I *was reminded* of those days, *when*, like them, I *had known* neither care nor sorrow, and a holiday was the summit of earthly felicity.

2 Parse, from the quotation in question 1, *whether*, *was reminded*, *when*, *had known*. Give the syntax of the phrase *in which*.

3 Distinguish in meaning between the italicized auxiliaries in *each* of the following pairs of sentences: (*a*) I acknowledge that I *may* be wrong, You *may* go tomorrow if you have your lessons; (*b*) If he *should* feel better he would go, You *should* go at all events; (*c*) I *shall* send you the box Thursday, I *will* get the package when you need it; (*d*) I *might* wait till next week to read the book, I *could* wait till next week to read the book.

4 Give the classification (subdivision if adverbial) and the syntax of *each* of the subordinate clauses in the following sentences: (*a*) It is owing to that very man that the literature of his period has experienced a duration beyond the ordinary term of English literature, (*b*) I shall endeavor, as far as I am able, to render it in modern parlance, (*c*) He declined two bishoprics, that he might shut himself up and write for posterity.

5 Write a letter to a friend inviting him (her) to spend his (her) summer vacation with you at your home in the country and describing various attractions.

6 Give the part of speech and the syntax of *each* of the italicized words in the following: (*a*) I sought to take refuge from their noise by *penetrating* still deeper into the solitudes of the pile, (*b*) I had seated *myself* at the table, (*c*) I soon

found it an exceedingly fluent, conversable little *tome*, (*d*) I caught a glimpse of a countenance ***which*** I thought I knew, (*e*) A few ***centuries*** since, five or six hundred manuscripts constituted a great library.

7 Select from the following the incorrect sentences and rewrite in correct form, giving the reason for each correction: (*a*) They again reproduced the picture a second time in order that all might see it, (*b*) She is fully as bright if not more so than her sister, (*c*) The river being impassable, we did not attempt to cross, (*d*) While visiting in the country with my cousin, she discovered a beautiful cave, (*e*) Every boy and every girl in the school is interested in the approaching vacation, (*f*) Neither he nor his brothers were there when we arrived, (*g*) It had been the custom in the village either to give the children Bible names or the names of prominent citizens.

8 Write sentences containing phrases denoting ***three*** of the following: (*a*) instrument or means, (*b*) limit of motion, (*c*) agency, (*d*) accompaniment, (*e*) place from which.

Second division 9 Sketch the scene to which Rip Van Winkle is led by the old man of the glen.

10 Relate Irving's dream while in the British Museum library, as given in the "Art of Book-making."

11 Write, from "Stratford-on-Avon," a description of the burial place of Shakspere.

12 Mention, from *Ivanhoe*, a prominent trait in Rebecca's character and describe an incident illustrating this trait.

13 State by whom and under what circumstances the following was uttered:

Alas! than mine a mightier hand
Has tuned my harp, my strings has spanned!
I touch the chords of joy, but low
And mournful answer notes of woe.

14 Sketch the scene in which John Alden gives Priscilla's answer to Miles Standish.

15 Give, from *Snow-bound*, a description of (*a*) the uncle, (*b*) the aunt.

High School Department

172D EXAMINATION

ENGLISH—Second Year

Tuesday, January 28, 1902—9.15 a. m. to 12.15 p. m., only

Answer eight questions but **no more,** *including at least three from the first division. If more than eight are answered only the first eight answers will be considered. Each complete answer will receive* 12½ *credits. The whole paper will be criticized as an exercise in English composition. Papers entitled to 75 or more credits will be accepted.*

First division 1 Write a paragraph of about 75 words on *one* of the following topics: *a*) The effect of the vision on Sir Launfal's conduct, *b*) How David Swan's life was saved by means of a dog.

2 In the following paragraph point out *a*) the topic sentence, *b*) the relation of the second sentence to the first sentence, *c*) the words in the third sentence on which the fourth sentence depends, *d*) a transition by means of a phrase, *e*) an antithesis:

Practically, then, at present, "advancement in life" means, becoming conspicuous in life; obtaining a position which shall be acknowledged by others to be respectable or honorable. We do not understand by this advancement, in general, the mere making of money, but the being known to have made it; not the accomplishment of any great aim, but the being seen to have accomplished it. In a word, we mean the gratification of our thirst for applause. That thirst, if the last infirmity of noble minds, is also the first infirmity of weak ones; and on the whole, the strongest impulsive influence for average humanity: the greatest efforts of the race have always been traceable to the love of praise, as its greatest catastrophes to the love of pleasure.

3 Mention the figure of speech in *each* of the following and rewrite each sentence, expressing the thought without using figurative language: *a*) Fortune was bending over him, just ready to let fall a burden of gold, *b*) Healthy and quiet age does not sleep thus, *c*) The little spring laughed and leaped in the shade, *d*) For Antony is but a limb of Caesar, *e*) Then, as lightly as a sunbeam on a cloud, she placed her foot on the cowering form.

4 Define *each* of the following: continuity (sequence) in paragraph structure, loose sentence, climax, tautology, blank verse.

5 Correct the following sentences: *a*) It is impossible to state how seriously he may be affected nor his chances of recovery, *b*) We met an old man about noon who was watch-

ing a little boy who was trying to catch some fish, *c*) My friend was ill and so we could not go but my sister went and as it was moonlight the sail was very delightful, *d*) The new train is much faster than the old ones which are slower but the fare is higher, *e*) The defenders of Bunker hill had no protection but stone fences joined to their own insuperable courage.

Second division 6 Show how perseverance, mystery and sorrow are interwoven in the life of old Esther Dudley.

7 Give an account of Sir Roger's experiences with the gipsies.

8 Show how the death of the albatross affected the voyage of the ancient mariner.

9 Explain the meaning of the italicized words in the following selection from the *Cotter's Saturday night:*

Belyve, the elder bairns come drappin' in,
At service out, amang the farmers roun':
Some *ca'* the pleugh, some herd, some *tentie rin*
A *cannie* errand to a neebor town.

10 Write the description of winter as given in Lowell's *Vision of Sir Launfal.*

11 Give an account of Mrs Winthrop's first visit to Silas Marner.

12 Describe the meeting between Antony and the conspirators immediately after the death of Caesar.

University of the State of New York

High School Department

174TH EXAMINATION

ENGLISH—Second Year

Tuesday, June 17, 1902—9.15 a. m. to 12.15 p. m., only

Answer 10 questions but **no more,** *including at least three from the first division. If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. The whole paper will be criticized as an exercise in English composition. Papers entitled to 75 or more credits will be accepted.*

First division

1 Write a paragraph of at least 75 words, describing Lady Eleanore Rochcliffe.

2 Show in detail the points of contrast in the following paragraph:

Now their separate characters are briefly these. The man's power is active, progressive, defensive. He is eminently the doer, the creator, the discoverer, the defender. His intellect is for speculation and invention; his energy for adventure, for war, and for conquest wherever war is just, wherever conquest necessary. But the woman's power is for rule, not for battle,—and her intellect is not for invention or creation, but for sweet ordering, arrangement, and decision. She sees the qualities of things, their claims, and their places. Her great function is praise: she enters into no contest, but infallibly adjudges the crown of contest.

3 Mention the rhetorical quality violated in *each* of the following sentences and correct each sentence: (*a*) He pointed to the men who stood near the stone wall which shut in the garden and private grounds, (*b*) The condition of the river has brought on the annual flood which comes every year, (*c*) Sergeant Russell visited the people and supplied those who needed aid with coal and provisions, (*d*) The day was pleasant and I wore my new hat, (*e*) She promised her mother while she was away that she would do as she had asked.

4 Mention the figures of speech in the following and show the points of comparison:

a And why should Caesar be a tyrant then?
Poor man! I know he would not be a wolf,
But that he sees the Romans are but sheep.

b His words were shed softer than leaves from the pine,
And they fell on Sir Launfal as snows on the brine.

5 Write an introductory paragraph for an essay on Famous Men of Today.

6 Mark the scansion of the following lines, stating the prevailing foot and meter; select an example of masculine rime, feminine rime, run-on lines:

a Now the heart is so full that a drop overfills it,
We are happy now because God wills it.

b Let us find our sweetest comfort
In the blessings of today;
With a patient hand removing
All the briars from our way.

Second division 7 Describe, from the "Minister's black Veil," Elizabeth's attempt to persuade the minister to lay aside the veil.

8 Write a description of the Old Province house as given in "Howe's Masquerade."

9 Give an account of Sir Roger's trip to Spring Garden (Vauxhall).

10 Give a sketch of what Ruskin says in regard to Shakspere's testimony to the position and character of women.

11 Describe in detail, from the *Ancient Mariner*, the picture of the calm that followed the killing of the albatross.

12 Explain the meaning of the italicized words in the following selection from the *Cotter's Saturday Night:*

But now the supper crowns their simple board,
The halesome *parritch*, chief o' Scotia's food:
The *sowpe* their only *hawkie* does afford,
That '*yont* the *hallan* snugly chows her cood.

13 Explain the connection of Dunstan Cass with the plot of *Silas Marner*.

14 Give an account of the circumstances under which the following was uttered:

There is a tide in the affairs of men,
Which, taken at the flood, leads on to fortune;
Omitted, all the voyage of their life
Is bound in shallows, and in miseries.
On such a full sea are we now afloat;
And we must take the current when it serves,
Or lose our ventures.

15 Give, from the *First Bunker Hill Oration*, a sketch of the part addressed to the veterans of the Revolution.

High School Department

172D EXAMINATION

ENGLISH—Third Year

Wednesday, January 29, 1902—1.15 to 4.15 p. m., only

Answer eight questions but no more, *including at least two from the first division. If more than eight are answered only the first eight answers will be considered. Each complete answer will receive 12½ credits. The whole paper will be criticized as an exercise in English composition. Papers entitled to 75 or more credits will be accepted.*

First division 1 State what is meant by *each* of the following: impressional description, circumstantial description, element of suspense in narration, climax in narration.

2 Write a description of a gateway as seen from a point of view near by.

3 Narrate an incident connected with the gateway mentioned in question 2, using the following items: a lost child, an elderly gentleman, a crowd of people.

4 Write an appreciative letter to the author of a magazine article or of a short story which has specially pleased you. Address the author in care of the publishers.

Second division 5 Describe the different views taken by *L'allegro* and *Il penseroso* in regard to *one* of the following: morning, evening, music.

6 Give, from the *Conduct of the understanding*, Locke's account of the effect of practice and habits on *a*) the body, *b*) the mind.

7 Give somewhat in detail, from the *Essay on Milton*, Macaulay's comparison of *Comus* and *Samson Agonistes*.

8 "Let it not be objected that he did little. He did much, if we consider where and how."

Give, from the *Essay on Burns*, Carlyle's justification of the above statement in relation to Burns.

9 Show how Emerson applies the law of compensation to *each* of the following: *a*) labor, *b*) crime, *c*) weakness and defect.

10 Describe the recognition of Sohrab by Rustum.

11 Discuss Shylock's treatment of Antonio, giving Shylock's defense of his conduct.

12 Describe the circumstances under which Harry Warrington became acquainted with the Lambert family and show how this incident furthers the development of the story.

High School Department

174TH EXAMINATION

ENGLISH — Third Year

Wednesday, June 18, 1902 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more,** *including at least two from the first division. If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. The whole paper will be criticized as an exercise in English composition. Papers entitled to 75 or more credits will be accepted.*

First division

1 State what is meant by a paragraph of impressional description. Give, with explanation, *two* directions peculiarly applicable in writing such a paragraph.

2 Classify, as impressional or circumstantial, the description illustrated in the following paragraph, and justify your classification by detailed references to the paragraph:

> The last beams of day were now faintly streaming through the painted windows in the high vaults above me; the lower parts of the abbey were already wrapped in the obscurity of twilight. The chapels and aisles grew darker and darker. The effigies of the kings faded into shadows and the marble figures of the monuments assumed strange shapes in the uncertain light.

3 Narrate an incident based on the following details: a class recitation, the appearance of smoke and discovery of fire, presence of mind of the teacher.

4 Summarize in a single paragraph the first act of Shakspere's drama, the *Merchant of Venice.*

Second division

5 Show how the plan and purpose of *L'allegro* differ from the plan and purpose of *Il penseroso.*

6 State the theme of *Comus* and show how the theme is brought out in the development of the poem.

7 Describe the method of reading recommended by Locke in the *Conduct of the Understanding* and show its advantages.

8 Write explanatory notes on the italicized words in the following from the *Essay on Criticism:*

a The mighty *Stagirite* first left the shore.
b Thee bold *Longinus!* all the Nine inspire.
c A *Raphael* painted, and a Vida sung.
d And *Boileau* still in right of *Horace* sways.

9 Give, from the *Essay on Milton,* Macaulay's estimate of the Royalists.

10 Sketch Carlyle's comparison of Burns and Byron as given in the *Essay on Burns*.

11 Expand *one* of the following quotations from *Compensation* into a paragraph that will fully express Emerson's thought: (*a*) You can not do wrong without suffering wrong, (*b*) The borrower runs in his own debt, (*c*) The good are befriended even by weakness and defect.

12 Select, from *Sohrab and Rustum*, *three* vivid word pictures and describe *one* of them.

13 Sketch, from the *Merchant of Venice*, the behavior of *each* of the following in the trial scene: Bassanio, Antonio, Shylock.

14 Describe, from *As you like it*, the feeling existing between Oliver and Orlando, and show how their reconciliation was brought about.

15 Give a sketch of the early life at Castlewood of Madam Esmond and her sons.

High School Department

170TH EXAMINATION

ENGLISH COMPOSITION

August 1901 — Three hours, only

Answer questions 11–15 and five of the others but **no more.** *If more than five of the others are answered only the first five answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Expand the following topic sentence into a paragraph of at least 75 words: Perseverance wins in the end.

2 Write a letter to a friend, describing life at Chautauqua.

3 Combine the following into a single well expressed sentence: The traveler was a man of middle age. He was wrapped in a gray coat. He quickened his pace. He had reached the outskirts of the town. A gloomy extent of four miles lay between him and his home.

4 Write the following sentences in correct form: *a*) Having had the misfortune to injure his thumb through his incapacity they lost the game, *b*) He has the refusal of the lot which fronts Spencer street for a week, *c*) Rowing across the lake a squall struck him, *d*) We sat down by the monument which had been erected in honor of George Washington who has done so much for his country, *e*) The meadow was completely surrounded on all sides by a stream that ran all around it.

5 Give an example of *a*) loose sentence, *b*) periodic sentence, *c*) balanced sentence.

6 Contract the following into simple sentences, stating in detail the changes made: *a*) They refused to go with us because they were very tired, *b*) He is a man who says very little, *c*) Since the weather was so cold we decided not to go, *d*) She left on the early train in order that she might avoid the crowd, *e*) Money which has been foolishly spent is generally much needed afterward.

7 Write a letter to a friend who is residing in Europe and who is specially interested in educational work in America.

8 Show how unity is violated in the following sentence and rewrite the sentence so that unity will be preserved: It happened that I was ill on that day and could not go, but one of my friends went and the trip was very delightful; at least that *is what she* told me.

9 Prepare an outline for an essay on *one* of the following topics, making sufficient subdivisions to show what matter you intend to include in the essay: *a*) Public charities, *b*) Travel in the 20th century.

10 Expand the first head of your outline (question 9) into an introductory paragraph of about 75 words.

11–15 Write an essay of at least 250 words on *one* of the following topics, paying particular attention to introduction and conclusion, sequence of thought, paragraph structure and sentence transition [Essays on subjects other than those assigned will not be accepted]: *a*) Lost opportunities, *b*) The educational value of expositions.

High School Department

171ST EXAMINATION

ENGLISH COMPOSITION

Tuesday, September 24, 1901 — 1.15 to 4.15 p. m., only

Answer questions 11–15 and five of the others but **no more.** *If more than five of the others are answered only the first five answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Write a paragraph of at least 75 words on *one* of the following topics: *a*) The last combat between Ivanhoe and Brian de Bois-Guilbert, *b*) Bravery in every day life.

2 Write a letter to a friend whom you have recently visited, thanking her for courtesy shown to you.

3 Write the following sentences in correct form: *a*) Much praise is due to the untiring efforts exerted by Mrs White, and which contributed largely to the success of the undertaking, *b*) Soon after the patient begins to use this medicine a demand is created for food that has not existed before, *c*) Having always felt a deep interest in scientific studies, the question was immediately investigated by him, *d*) We will send the brush on trial on receipt of 50 cents, which will be returned if not as represented, *e*) With his natural bent of character and the fact of his broad education leads me to think that he must have done it.

4 Combine the following into a single well expressed sentence: We surprised a grizzly bear. He was sauntering along the river. He raised himself on his hind legs. He took a deliberate survey of us. This did not appear very satisfactory to him. He scrambled into the river and swam to the opposite shore.

5 Explain, by showing the force of the italicized connectives, how transition in the following paragraph is secured:

We have seen that great men are great workers — that some great men flower early, *and* that others flower late. Some, *however*, never flower at all. They do not reach maturity, *but* succumb in their struggle for greatness, and die in the midst of their efforts.

6 Show how unity is violated in the following sentence and rewrite the sentence so that unity will be preserved:

We read all the books we could find (that is, if they were at all interesting) and newspapers that were months old, that had been left by the former occupants of the cottage, who were people that evidently read a great deal.

High School Department

172D EXAMINATION

ENGLISH COMPOSITION

Monday, January 27, 1902 — 1.15 to 4.15 p. m., only

Answer questions 11-15 and five of the others but **no more.** *If more than five of the others are answered only the first five answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Write a paragraph of at least 75 words on *one* of the following topics: *a*) Rebecca's gift of 100 zechins to Gurth, *b*) A successful life.

2 Write a note to accompany a Christmas gift to a friend.

3 Write sentences illustrating the distinction in use between *a*) *in* and *into*, *b*) *emigrant* and *immigrant*, *c*) *principal* and *principle*, *d*) *less* and *fewer*, *e*) *may* and *can*.

4 Write the following sentences in correct form: *a*) He has already and will for some time in the future, study Latin, *b*) All bills are requested to be paid quarterly, *c*) Several novels and two or three popular magazines were on the table, and a large lamp and inkstand, *d*) Noticing the advertisement in the paper, and as I thought I could fill the position I applied for it, *e*) Fresh air is the best medicine, which, if more widely known, men would be the better for it.

5 Express the following in simple English: *a*) She was in a state of such extreme felicity that she could not refrain from expressing her sentiments, *b*) There was almost a precise counterpart of himself in one of his juvenile associates, *c*) The enterprise which has this magnificent culmination was initiated on a diminutive scale, *d*) The thief will be apprehended as he has but an inconsiderable advantage of the officer who is in pursuit, *e*) At the expiration of four years, having acquired an extended acquaintance with maritime affairs, he requested that he be promoted to a more exalted station.

6 Write *a*) a loose sentence containing at least 20 words, *b*) a periodic sentence containing at least 20 words. Change the loose sentence to the periodic form and the periodic sentence to the loose form.

7 Write a note to a merchant in a distant city, asking for samples of several kinds of goods. Give details in regard to prices.

8 Mention *two* characteristics of a good introductory paragraph; *one* characteristic of a good concluding paragraph. Show by original sentences *two* means by which transition in sentence structure may be secured.

9 Give, from *Ivanhoe*, an account of the rescue of Isaac by the Palmer and show how this incident advances the plot of the story.

10 Describe the arrest of the Grand Master and the departure of the templars from the preceptory of Templestowe.

11–15 Write an essay of at least 250 words on *one* of the following topics, paying particular attention to introduction and conclusion, sequence of thought, paragraph structure and sentence transition [Essays on subjects other than those assigned will not be accepted]:

a) A competition in archery [Give an account of the contest of the yeomen at the conclusion of the sports at Ashby], *b*) Honor among outlaws [Let the Black Knight describe the scene around the trysting-tree up to the time of his departure].

NOTE—Students not familiar with *Ivanhoe* may write on *one* of the following: *a*) A Christmas tree, *b*) A wonderful dollar.

University of the State of New York

High School Department

173D EXAMINATION

ENGLISH COMPOSITION

Monday, March 24, 1902 — 1.15 to 4.15 p. m., only

Answer questions 11-15 and five of the others but **no more.** *If more than five of the others are answered only the first five answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Define paragraph. Illustrate by writing a paragraph of at least 75 words on the following topic: The courage of Ivanhoe.

2 Express the idea of the following sentence in *five* other ways: He bore, like his companion, a scrip, attached to his belt, but had neither horn nor knife, being probably considered as belonging to a class whom it is esteemed dangerous to intrust with edge-tools.

3 Write a letter to a friend, thanking him for a book that he has recently sent you. State why the book was particularly acceptable.

4 Combine the following into a single well expressed sentence:

It was midnight. The boy looked upward. He saw the moon. The moon was round, bright and silvery. He thought he would like nothing better than to soar up there. He thought he would like to spend his life there.

5 Write the following sentences in correct form: *a*) I remember seeing him when he was very young and that even then he was an exceptionally bright child, *b*) His face was pale and drawn, and, leaning on his cane, it was plainly evident that he was suffering, *c*) The gentleman fell and broke his arm, and he was a very stout man, *d*) In reply to your letter of the 24th in regard to Mr Thorn, he has been with us for several years and is a very reliable man, *e*) Wanted.—A nearly new woman's bicycle. Address P. O. Box 67, Buffalo, N. Y.

6 Divide the following sentence into *three* sentences, giving a reason for each change made:

I was once an enlisted soldier, under the three months' call, and for three days was in camp at Hartford, sleeping in tents, rising at the tap of the drum, going through the routine of drill, and thrice daily marching to the Clinton house for rations, when the word came from Washington that no more three months' men were wanted in front, but three years', or for the war, it having at last penetrated the brains of the men in authority that the contest was no boy's play of two or three months, but man's work for an indefinite period.

7 Define unity in sentence structure and mention *three* ways in which it may be violated.

8 Write a letter to a dealer in dry goods with whom you are acquainted, introducing and recommending a friend who is desirous of securing a position in his store.

9 Narrate the circumstances under which *two* of the following are introduced into *Ivanhoe:* Brian de Bois-Guilbert, the Black Knight, Lady Rowena, the friar.

10 Describe the relations between the Saxons and the Normans during the reign of Richard I, illustrating by an incident from *Ivanhoe.*

11–15 Write an essay of at least 250 words on *one* of the following topics, paying particular attention to introduction and conclusion, sequence of thought, paragraph structure and sentence transition [Essays on subjects other than those assigned will not be accepted]:

a) A trusty messenger [Give an account of Gurth's visit to Isaac of York the evening after the victory of the Disinherited Knight], *b*) A pledge of good-will [Let Wamba tell how he and the Black Knight were rescued by the winding of three mots on Locksley's bugle].

NOTE—Students not familiar with *Ivanhoe* may write on *one* of the following: *a)* A brave deed, *b)* The little flower's wish.

High School Department

174TH EXAMINATION

ENGLISH COMPOSITION

Monday, June 16, 1902 — 1.15 to 4.15 p. m., only

Answer questions 11-15 and five of the others but **no more.** *If more than five of the others are answered only the first five answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Write a paragraph of at least 75 words on *one* of the following topics: (*a*) The first Appearance of the Black Knight, (*b*) The Necessity of Exercise.

2 Rearrange the following, making *two* distinct paragraphs and combining the sentences where necessary:

At the foot of the Catskill mountains is a little village of great antiquity. In this village there lived a simple good-natured man. His name was Rip Van Winkle. The village was founded by some of the Dutch colonists. It was founded in the early days of the province. Rip Van Winkle was a kind neighbor. He was an obedient, henpecked husband. The village was founded about the time of the beginning of the government of Peter Stuyvesant. Rip Van Winkle possessed, moreover, a certain meekness of spirit which gained him universal popularity.

3 Write a letter to a friend, asking him (her) to lend you a book. State in detail why you wish this particular book.

4 Write the following in correct form: (*a*) He can not be persuaded to go or into buying what he does not want, (*b*) The carriage did not come and it rained and so we did not go, (*c*) They did not object to her marrying him but preferred her to have waited a few years, (*d*) I have selected both the blue and brown dress, (*e*) Lost — A gold ring, containing a ruby set with diamonds between Main and Pearl streets.

5 Rewrite the following sentences, substituting correct connectives for the italicized words; give a reason for each change made:

A short time afterward I was invited by my aunt to pay her a visit *and* I was ill and could not go *and* I told her that I should be glad to go as soon as I was better. She answered immediately telling me to come whenever I could *and* she would always be glad to see me.

6 Show by original sentences the difference between (*a*) contraction of sentences and expansion of sentences, (*b*) a loose sentence and a periodic sentence.

7 Correct the errors in the use of words in the following sentences without giving reasons: (*a*) As he was a thorough gentleman, he treated us very respectively, (*b*) You must have thought it funny that I did not come, (*c*) I shall be very glad to except your kind invitation for next Tuesday, (*d*) The people in this part of the city are noted for their observation of the Sabbath, (*e*) Lots of people go to Florida in the winter.

8 Assume that you live in New York and that your brother has applied for a position as department manager with Green & Co. New York, dealers in dry goods. While he is away in Boston you learn that the position is vacant and that it will be kept open for him two days. Telegraph your brother to come, stating important facts in not more than 10 words.

9 Mention *three* traits of Athelstane's character, illustrating each by reference to *Ivanhoe*.

10 Describe Cedric's plan for restoring the Saxon independence and explain why he was compelled to abandon it.

11–15 Write an essay of at least 250 words on *one* of the following topics, paying particular attention to introduction and conclusion, sequence of thought, paragraph structure and sentence transition [Essays on subjects other than those assigned will not be accepted]:

(*a*) The Storming of a medieval Castle [Give Rebecca's description of the storming of Front-de-Boeuf's castle up to the time of the fall of the postern-gate], (*b*) A Slave's Devotion [Let Cedric tell how Wamba rescued him from Front-de-Boeuf's castle].

NOTE — Students not familiar with *Ivanhoe* may write on *one* of the following: (*a*) The Pleasures of Nature, (*b*) The Adventures of a lost Letter.

High School Department

172D EXAMINATION

ADVANCED ENGLISH COMPOSITION

Wednesday, January 29, 1902 — 1.15 to 4.15 p. m., only

Answer eight questions but **no more.** *If more than eight are answered only the first eight answers will be considered. Division of groups is not allowed. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

1 Explain in detail what is meant by the plot of a narrative. Mention, with explanation, *two* ways in which a narrative may be introduced.

2 Assume that you have lost an umbrella. Describe the umbrella minutely.

3–4 Write a narrative connected with the loss of the umbrella mentioned in question 2, using the following details: discovery that the umbrella was taken by a friend through carelessness, return of the umbrella with a new handle, an explanation and an apology.

5 Write a character sketch of one of your friends, bringing out commendable characteristics.

6 A very quiet night. When the moon shines very brilliantly, a solitude and stillness seem to proceed from her, that influence even crowded places full of life. Not only is it a still night on dusty high roads and on hill-summits, whence a wide expanse of country may be seen in repose, quieter and quieter as it spreads away into a fringe of trees against the sky, with the gray ghost of a bloom upon them; not only is it a still night in gardens and in woods, but even on this stranger's wilderness of London there is some rest.

Classify the description illustrated in the above paragraph as impressional or circumstantial. Justify your classification by a discussion of the paragraph.

7–8 Two friends, after a separation of several years, meet unexpectedly in a strange city and talk over the experiences of each since their last meeting. Report the conversation.

9–10 Write an abstract of the following article, containing not more than *four* well constructed paragraphs:

One can not enter the gates of the Pan-American exposition at Buffalo without mentally reverting to the city of White Palaces of 1893, only eight years ago, with its throngs of amazed and delighted people. Even while the mind is filled with delight and astonishment, there comes a subconscious picture of the neglected "Pinta" which sailed so boldly across the Atlantic, and now lies abandoned in a marsh among the charred ends of many piles — the only remaining vestiges of that famous White city. What a shame if these marvelous creations at Buffalo are to meet a similar fate! "What a pity," the visitor reflects, "that another two or three millions could not have been added to the funds at the disposal of the commission, in order that the walls might stand in substantial brick and mortar instead of wood and staff." They might have required that the exposition should have been located a few miles farther out on the prairie. Then at its close the aggregation of palaces might be converted into a model city; the Palace of Liberal Arts might become a great factory; the Temple of Music stand as the theater hall; the Stadium remain a great amphitheater. The buildings constructed by the states of North and South America would become private houses set in the most beautiful of parks. Another million or, at the most, two millions expended would have left every wall in the most durable of materials. What a pity then, what a waste that this small additional sum should not have left the work of great artists in lasting form!

For this is the lesson of the fair—that it illustrates what men working in harmonious effort may accomplish for the delight of all. Who believes that the people of the second half of our new century will be content to live in those abominations of desolation which we call our great cities—brick and mortar piled higgledy-piggledy, glaringly vulgar, stupidly offensive, insolently trespassing on the right to sunshine and fresh air, conglomerate result of a competition which takes no regard for the rights of one's neighbor?

As one wanders in these streets of varied forms, the mind is entranced by the eternally changing color always in marvelous harmony. Down the great central court to the left, by the fountains on the Esplanade, in the maze of the Horticultural and Graphic Arts buildings, then under the graceful pergolas to the magnificent erections on the Bridge of Triumph, the colors change and change until the whole prismatic spectrum seems to have been exhausted twenty times over—yet there is never a repetition, only restful harmony.

How was this present marvel constructed? Very simply. The men of high intelligence whose liberality is responsible for this exhibit came together and said: "Let us seek out the great artists in architecture, in sculpture, in landscape, and bring them here to Buffalo. Then we will ask them to work out in unison a scheme, every part of which shall be in perfect harmony with every other part; shape, environment, distance, color, shall all unite in one great harmony."

This, then, may be taken as the great central idea of the Pan-American exposition. It is a prophecy of what the city of the future must be—a beautiful location arranged, first, with reference to its landscape; second, with reference to its form and perfection, and, next, with reference to satisfying the eye in its blending colors.

When commerce ceases to be war, when the world ceases to educate its best brains for the destruction which is the result of competition, when human talent shall be converted to its highest sphere of usefulness, then we shall have the sites of cities selected by commissions having the highest good of the proposed community at heart.

11 Write a Christmas greeting of at least 75 words to an absent friend.

12 Write an answer to an advertisement for a clerk, stating qualifications and experience and giving references.

High School Department

174TH EXAMINATION

ADVANCED ENGLISH COMPOSITION

Wednesday, June 18, 1902 — 1.15 to 4.15 p. m., only

Answer eight questions but **no more.** *If more than eight are answered only the first eight answers will be considered. Division of groups is not allowed. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

1 State the difference between description and narration. Mention, with explanation, *two* ways in which narration is aided by description.

2 Write a description of a man in such a way as to convey the impression of strength of character.

3–4 Write a narrative in which the man mentioned in question 2 takes a prominent part, using the following details: a child on a railway track, an approaching locomotive, a rescue.

5–6 Two friends who meet at dinner discuss the value of a college education. Report the conversation exactly as given, in choice English.

7 Indicate a plan for a simple narrative by outlining a situation presenting a difficulty, an incident and the result of the incident. [Do not use any of the details given in questions 3–4.]

8 In a single paragraph summarize the contents of some book that you have read in connection with your school work.

9–10 Write an abstract of the following article, containing not more than *four* well constructed paragraphs:

Sixty young Cuban women, some of them representing the oldest and most influential families of Cuba, under contract with the Cuban government to teach in the public schools of Cuba, are receiving their professional training in the State normal school at New Paltz. The school authorities of the state of New York entered into contract with the Cuban government to receive these students, to assume the responsibility for their professional training, and to provide rooms, board, and ordinary washing for the sum of six dollars a week for each student. The use of the school equipment is given free by the state. In addition to traveling expenses to and from this country, each student is paid by the Cuban government twenty dollars a month to meet personal expenses.

These students have had some educational advantages in the schools of Cuba, and they gained the privilege of professional training by passing special examinations conducted by the school authorities there. Many of them bear the names of men identified with the Cuban struggle for freedom — men who have given their all in defense of that cause. Others are the daughters of wealthy families impoverished by the war, who, like the daughters of our southern families at the close of the Civil War, find themselves confronted with the problem of self-support. These students are utilizing their training, acquired for a life of social ease and luxury, to meet the new problems.

The first students arrived in September of last year, the last group the last of October, yet some have already acquired a working school vocabulary that enables them to do subject work in classes. The mornings are given to language work, the old district school-house of New Paltz being devoted to the use of the Cuban students. Those who have not a working vocabulary do subject work in their own language, under normal school methods, in the afternoon.

It is difficult to realize, when in the language classes, that but five of these students spoke English when they entered the normal school. There are two grades in English. As rapidly as the vocabulary necessary to class work in any subject is acquired, the students begin grade work with the regular students, the freer intercourse being welcomed as an opportunity making necessary the use of English wholly. So intense is their interest, so earnest are these students, that they have astonished their teachers by their advance.

These students have also made marked progress in physical culture, their basket-ball team having reached a stage where it enters contests with a fair chance of winning. They have developed physically since entering the school, and show in every way that their lives and the work they do are perfectly balanced.

The social side is developed in harmony with the ideal of their own country. Every teacher in the school stands in the relation of special friend to the strangers, whose devotion and earnestness appeal so strongly to all. Receptions at which there is dancing are attended by all the faculty and the students, and form another means of development as well as of enjoyment. These students have contributed often to the pleasure of social events of the school by the quickness with which they improvise an evening's entertainment.

The wisdom of keeping the Cuban students in a community life is evident. The spirit of helpfulness engendered prevents anything that has the appearance of striving or competition. The observing, sympathetic visitor realizes the intellectual community feeling, as well as the social. They have a common purpose—to return as teachers to their own country; and to accomplish this they must work together. Their interest in their work is inspirational. Teachers are stimulated to more than professional pride by their rapid advance. Their presence in the school and in the town imposes responsibilities on the teachers from which they are never free.

11–12 Write an essay on *My Studies*, stating likes and dislikes, and giving reasons for considering one of these studies profitable or unprofitable.

High School Department

171ST EXAMINATION

RHETORIC

Tuesday, September 24, 1901—9.15 a. m. to 12.15 p. m., only

Answer questions 10-12 and five of the others but **no more.** *If more than five of the others are answered only the first five answers will be considered. Each complete answer will receive* 12½ *credits. Papers entitled to 75 or more credits will be accepted.*

1 Develop the following into a descriptive paragraph containing at least 75 words: It was a beautiful June day. The sky was cloudless. The air was soft and fragrant.

2 In the following paragraph point out *a*) the topic sentence, *b*) the relation of the third sentence to the second sentence, *c*) the words in the third sentence on which the fifth sentence depends, *d*) an example of parallel construction, *e*) a periodic sentence:

What, exactly, is the secret of true success in life? It is to do, without flinching, and with utter faithfulness, the duty that stands next to one. When a man has mastered the duties around him, he is ready for those of a higher grade, and he takes naturally one step upward. When he has mastered the duties at the new grade, he goes on climbing. There are no surprises to the man who arrives at eminence legitimately. It is entirely natural that he should be there, and he is as much at home there, and as little elated, as when he was working patiently at the foot of the stairs. There are hights above him, and he remains humble and simple.

3 Mention the rhetorical defect in *each* of the following sentences and correct each sentence: *a*) The very things which I needed for the journey which I was going to make were not to be procured in the little village which was then my home, *b*) He promised his brother that he would pay his bills, *c*) It is some warmer this morning than it was yesterday, *d*) Mr Smith is to take charge of the work this summer, and people say he is a very fine man, *e*) The wave of progress flows onward, extinguishing in its course ignorance and superstition.

4 Show how unity, sequence and proportion may be secured in paragraph construction.

5 Mention the figures of speech in the following and show the points of comparison:

a) As the soil, however rich it may be, can not be productive without culture, so the mind, without cultivation, can never produce good fruit, *b*) The patches of moonlight lay like silver mats on the brown carpet of the woods.

6 In the following paragraph mention *a*) *three* violations of unity, *b*) *three* violations of clearness [Do not rewrite]:

It was a pleasant surprise to see Mrs Browning in Boston in the winter and we were sorry too, for she had come to take Mary (she was Mary's aunt) to join her sister who had decided to go south suddenly. Mary, always amiable, like her mother, was quite willing to go, but she said that she would come back soon two or three times; at least that she would try to.

7 Define blank verse, rhythm, meter, masculine rime, alliteration.

8 Relate, from "David Swan," the incident of the attempted robbery.

9 Describe, from "Howe's masquerade," the scene in which Sir William Howe challenged the spectral governor.

10–12 Write an essay of at least 250 words on *one* of the following topics [Essays on subjects other than those assigned will not be accepted]:

a) An old building, *b*) Labor and capital.

University of the State of New York

High School Department

172D EXAMINATION

RHETORIC

Tuesday, January 28, 1902—9.15 a. m. to 12.15 p. m., only

Answer questions 10–12 and five of the others but **no more.** *If more than five of the others are answered only the first five answers will be considered. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

1 Develop the following topic sentence into a paragraph of at least 75 words: It was a moment to be remembered.

2 In the following paragraph state *a*) the topic sentence, *b*) the bearing of sentences three and four on the main thought of the paragraph, *c*) the force of the connective *but* in the fifth sentence, *d*) the relation of the sixth sentence to the fifth sentence:

Cultivate humility. It is the attribute of great and noble minds. Sir Isaac Newton said at the close of life that he had been like a child who had spent its time in gathering pebbles on the shore, while the ocean remained untraversed. Mozart, the great musician, just before he died, said, "Now I begin to see what might be done in music." These men ascended to a high elevation on the mountain of knowledge; *but* this merely gave them a better idea of the loftiness of the summit. The more we know, the more we shall be convinced of our own ignorance.

3 Select from the above paragraph *a*) a simile, *b*) a metaphor. Trace the points of comparison in each case.

4 Criticize and correct the following:

a) Sometimes she walked with her father and with her mother at other times, *b*) Alarmed at the sad news, the carriage was ordered immediately, *c*) When my sister came home, feeling tired, I laid aside my work and talked to her, *d*) There were a great many people in the church and the service would not begin for an hour, *e*) Our lives fade and die in the end but some flow peacefully while they last.

5 Rewrite the following in correct form:

New York, Dec. 26, '01

My dear friend:

I want to thank you for your Christmas present, which arrived safely, and I was very much pleased with it; also your letter, which came in the morning. I received another beautiful picture which was given me by a friend who painted it herself. The picture (the one that you sent, I mean) I have hung in my room and I can see it often, and I know whenever I look at it it will make me think of you always.

Your grateful friend
Mary L. Brown

6 Prepare an outline for an essay on *My favorite book*, making sufficient subdivisions to show what matter you intend to include in the essay.

7 In the following stanzas mark the scansion and state the prevailing foot and meter; select from them an example of end-stopt verse, alliteration, feminine rime:

a These grates, these walls, shall vanish then
For the fair field of fighting men.

b "Labor is worship!"—the robin is singing;
"Labor is worship!"—the wild bee is ringing:
Listen! that eloquent whisper upspringing
Speaks to thy soul from out nature's great heart.

8 Give an account of the first visit of Elinor and Walter to the painter.

9 Describe the effect of the storm on the various people in the street, as viewed in "Sights from a steeple."

10–12 Write an essay of at least 250 words on *one* of the following topics [Essays on subjects other than those assigned will not be accepted]:

a) Faithful unto death [Describe the meeting of old Esther Dudley with Governor Hancock when he came to take possession of the Province house], *b*) An exciting day [Give an account of what happened at Parker's Falls between the arrival and the departure of Dominicus Pike].

NOTE—Students not familiar with *Twice-told tales* may substitute *one* of the following: *a*) The ideal student, *b*) McKinley as a man and as a statesman.

High School Department

173D EXAMINATION

RHETORIC

Tuesday, March 25, 1902—9.15 a. m. to 12.15 p. m., only

Answer questions 10–12 and five of the others but **no more.** *If more than five of the others are answered only the first five answers will be considered. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

1 Write a descriptive paragraph containing at least 75 words, introducing the following: clouds, rain, people.

2 In the following paragraph show *a*) how unity is secured without the use of a topic sentence, *b*) how contrast is effected in the organization of the paragraph:

Some people, like the bee, seem to gather honey from every flower; while others, like the spider, carry only poison away. One person finds happiness everywhere and in every occasion, carrying his own holiday with him. Another always appears to be returning from a funeral. One sees beauty and harmony wherever he looks, his very tears affording him visions of resplendent rainbows as the sunbeams of hope fall upon him. Another is blind to beauty; the lenses of his eyes seem to be smoked glass, so that the whole world appears as if draped in mourning.

3 Rewrite the above paragraph, expressing the thought without using figurative language.

4 State the rhetorical defect in *each* of the following sentences and correct each sentence:

a) He found some apples on the trees which he ate, *b*) The tiny crimson drops on the dove's wing showed that the bird was injured, and it was very beautiful, *c*) After talking to him an hour about his book he left the room, *d*) On all sides in every direction we were completely surrounded by woods, *e*) The voyage of life is an isthmus between two eternities.

5 Write a paragraph of at least *four* sentences, using *three* of the following as transitional words: but, therefore, nevertheless, though, since, still.

6 In the following sentence mention *a*) *two* violations of unity, *b*) *one* violation of clearness; rewrite the sentence in correct form, using two or more sentences if necessary:

He built a large brick house on the hill (it cost $5000) and he had a large orchard which was at the side of the house which was near the road and little boys who would come into the orchard from the road would steal the fruit and he only would have a few apples left so he bought two large dogs to scare them away and they frightened them very much so they did not steal any more fruit.

7 Distinguish between *a*) long meter and short meter, *b*) masculine rime and feminine rime, *c*) run-on lines and end-stopt lines.

8 Describe in detail the influence of Walter and Elinor on the artist after he painted their portraits.

9 Show, by references to the story, the solution of the mystery of Mr Higginbotham's catastrophe.

10–12 Write an essay of at least 250 words on *one* of the following topics [Essays on subjects other than those assigned will not be accepted]:

a) A long remembered Sunday [Give an account of what happened the first day that Mr Hooper wore the black veil], *b*) A lonely life [Let one of the citizens in the town give an account of the way in which Esther Dudley spent her time at the Province house].

NOTE — Students not familiar with *Twice-told tales* may substitute *one* of the following: *a*) Anarchy in America, *b*) The will and the way.

University of the State of New York

High School Department

174TH EXAMINATION

RHETORIC

Tuesday, June 17, 1902—9.15 a. m. to 12.15 p. m., only

Answer questions 12–15 and six of the others but* no more.** ***If more than six of the others are answered only the first six answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.

1 Develop the following topic sentence into a paragraph of at least 75 words *either* by presenting contrasting ideas *or* by giving illustrations: The most successful men are not always those who make the most money.

2 In the following paragraph give (*a*) the topic sentence, (*b*, *c*,) the relation of the third and of the fourth sentence to the second sentence, (*d*) the bearing of the last sentence on the sentence preceding it, (*e*) an example of parallel construction:

A fine courtesy is a fortune in itself. The good-mannered can do without riches, for they have passports everywhere. All doors fly open to them, and they enter without money and without price. They can enjoy nearly everything without the trouble of buying or owning. They are as welcome in every household as the sunshine, for they carry light, sunshine, and joy everywhere. They disarm jealousy and envy, for they bear good-will to everybody. Bees will not sting a man smeared with honey.

3 Criticize and correct the following: (*a*) I counted 25 meteors, the other night, sitting on the front piazza, (*b*) The last train to leave the city Saturday and which crossed the bridge before the accident was the 5 p. m. train, (*c*) He used to use many expressions not usually used, (*d*) He carried a basket in his right hand while the other hand supported his mother, (*e*) She passed through life as a sea-gull skims the waves, sucking honey from every flower.

4 State the figure of speech in *each* of the following and show the points of comparison: (*a*) Men of genius are often dull and inert in society; as the blazing meteor when it descends to earth, is only a stone, (*b*) It is when our budding hopes are nipped beyond recovery by some rough wind, that we are the most disposed to picture to ourselves what flowers they might have borne if they had flourished.

5 Define unity and show how it may be secured in (*a*) the sentence, (*b*) the paragraph, (*c*) the essay.

6 Mention *three* rhetorical qualities violated in the following paragraph and rewrite the paragraph in correct form, using two or more sentences if necessary:

Some weeks ago while walking through the park (it was late in the afternoon) I saw a package which lay in a cross-road which was some distance ahead, so I walked very quickly but found that I had lost my pocket-book suddenly, so went back and left the package in the road but I did not find it and when I returned back again to the same place the package was gone.

7 Define *each* of the following: transition, balanced sentence, alliteration, climax, metonymy.

8 Mention and describe the kind of verse used in the following quotation; mark the scansion and give the prevailing foot and meter and the position of the cesuras:

> Neither a borrower nor a lender be,
> For loan oft loses both itself and friend;
> And borrowing dulls the edge of husbandry.
> This above all,—to thine own self be true;
> And it must follow, as the night the day,
> Thou canst not then be false to any man.

9 Explain the manner in which the festivities of Howe's masquerade were brought to an end.

10 Give an account of the rescue of Mr Higginbotham by Dominicus Pike and state its results.

11 State your opinion as to why Mr Hooper wore the black veil. Give arguments to justify your opinion.

12–15 Write an essay of at least 250 words on *one* of the following topics [Essays on subjects other than those assigned will not be accepted]:

(*a*) A colonial Ball [Give an account of the ball at the Province house held in honor of Lady Eleanore], (*b*) A skilful Artist [Let the artist give an account of the portraits that he painted for Walter and Elinor, showing how his work proved to be a prophecy of their lives].

NOTE—Students not familiar with *Twice-told Tales* may substitute *one* of the following: (*a*) The Visit of Prince Henry of Prussia to America, (*b*) The Reward of Persistence.

High School Department

172D EXAMINATION

HISTORY OF LITERATURE

Friday, January 31, 1902—1.15 to 4.15 p. m., only

Answer 10 questions but **no more**; *of these 10 questions at least five must be from part 1 in order to receive credit for English literature. and at least five from part 2 in order to receive credit for American literature. Answer 10 questions in all cases, whether credit is desired for either one of the two parts or for both parts. If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

English Literature

Part 1 1 Mention *three* prominent characteristics of old English (Anglo-Saxon) poetry, explaining each.

2 Write on *one* of the following: *a*) literature brought by the Normans and its effect on English literature, *b*) influence of Tyndale's translation of the Bible on English literature, *c*) novelists of the 19th century.

3 Give *three* reasons why Shakspere is ranked first among dramatists. Explain these reasons somewhat in detail.

4 State *three* characteristics of the puritans and show how these characteristics affected English literature.

5 What was the spirit of the age in which Pope lived? Show how this spirit is reflected in Pope's writings.

6 Select from the following list *three* poems and explain in detail *two* characteristics of each poem selected: *Cotter's Saturday night*, *Alexander's feast*, *Prothalamion*, *L'allegro*, *Deserted village.*

7 Mention *five* prose writers of the 18th century, state the class of works for which each is noted and give the title of a work of each.

8 Sketch the life of Scott and show how the environment of his early life influenced his poetry.

9 Write a sketch of a leading character in *one* of George Eliot's novels.

10 State *three* characteristics of the literature of the Victorian age. Mention *three* poets of this age and give the title of a poem of each possessing *two* of these characteristics.

American Literature

Part 2 11 Mention and describe *one* of Alexander Hamilton's contributions to American literature and explain why it was written.

12 Mention the sources from which Irving obtained the material for the *Sketch-book* and state why, in your opinion, this book still retains its charm.

13 "The ethical motive is very strong in Hawthorne's work." Prove the above statement by reference to Hawthorne's writings.

14 Sketch the life of Holmes, showing the departments of literature in which he was successful and mentioning a work in each department.

15 Mention the influences that resulted in the Brook farm experiment and state the purpose of this experiment.

16 Compare the poetry of Longfellow with that of Whittier, mentioning points of similarity and difference.

17 Give a sketch of the life of Bryant, showing the influence exerted by him in at least *two* fields of literature.

18 Write a sketch of a work by *one* of the following: Lowell, Harriet Beecher Stowe, Bayard Taylor.

19 Mention *three* prominent writers of short stories and give the title of a short story by each. State, with reference to *one* of the stories mentioned, the characteristics that make it successful.

20 Mention *five* well-known essayists living at the present time and give the title of a work of each.

High School Department

174TH EXAMINATION

HISTORY OF LITERATURE

Friday, June 20, 1902 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more**; *of these 10 questions at least five must be from part 1 in order to receive credit for English literature, and at least five from part 2 in order to receive credit for American literature. Answer 10 questions in all cases, whether credit is desired for either one of the two parts or for both parts. If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

English Literature

Part 1 1 State the importance in English literature of *each* of the following: Caedmon, the Venerable Bede, Alfred the Great.

2 Explain the immediate effect of the Norman Conquest on the production of English literature (not on the language).

3 Write on *one* of the following: (*a*) effect of the invention of printing on English literature, (*b*) the drama before Shakspere.

4 Write a brief account of the Elizabethan age, giving (*a*) approximate dates, (*b*) importance in literature, (*c*) *five* prominent writers.

5 Mention historical events that influenced the character of the writings of *two* of the following and show how these events produced that influence: Milton, Butler, Byron, Gladstone, Burke.

6 Sketch the life of Bacon and state why he is important in literature.

7 Explain what is meant by the classic school, the romantic school. Mention, with a work of each, *two* writers of each school. Show how each work mentioned is characteristic of its school.

8 Give an account of early periodical literature. Mention *two* important contributors to this literature and state the influence exerted by each.

9 Mention *three* characteristics of Tennyson's poetry, illustrating each by reference to his poems.

10 Arrange the following works in chronologic order, mentioning the author of each: *Cotter's Saturday Night*, *Faerie Queene*, *L'allegro*, *Prisoner of Chillon*, *Decline and Fall of the Roman Empire*, *Alexander's Feast*, *Sesame and Lilies*, *Essay on Criticism*, *Canterbury Tales*, *Lady of the Lake*.

American Literature

Part 2

11 What were the most important classes of literature previous to the Revolution? Explain.

12 State the importance of Franklin in literature. Show the relation between his political and his literary life.

13 Show how the literary work of Irving was an advance on any previous American work. Explain why his writings were so universally popular at the time.

14 Irving says that Cooper has left a place in literature not easily supplied. Contradict or defend this statement, giving reasons for your position.

15 What is meant by the Concord school of philosophy? State its purpose and its influence.

16 Write on *one* of the following: (*a*) literature at the time of the Civil War, (*b*) historians of the 19th century, (*c*) character of Longfellow's poetry.

17 Compare Bryant's descriptions of nature with those of Whittier, bringing out points of similarity and difference.

18 Write a sketch of the life of Bayard Taylor, touching on his work as poet, novelist and translator.

19 Characterize briefly the writings of *three* of the following: Holland, Whitman, Lanier, Burroughs, Helen Hunt Jackson, Bret Harte.

20 Mention *five* prominent writers of the present time (not found on this paper). State the class of works for which each writer mentioned is noted and give the title of a work of each.

High School Department

172D EXAMINATION

COURSE IN ENGLISH READING

Friday, January 31, 1902—1.15 to 4.15 p. m., only

Answer eight questions but **no more.** *At least four questions must be chosen from the second division. Each answer under the first division will be considered a short (20 minute) theme and will be graded for composition. If more than eight questions are answered only the first eight answers will be considered. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

First division 1 Describe, from the *Princess*, the scene in which Lady Psyche recognizes her brother.

2 Describe the trial scene in the *Merchant of Venice.*

3 Describe the scene in which Silas Marner announces the loss of his money to the men at the Rainbow.

4 Relate, from the *Vicar of Wakefield*, the circumstances under which Dr Primrose sold his horse.

5 Give, from *Ivanhoe*, an account of Prince John's endeavor to secure seats for Isaac and Rebecca at the tournament.

6 Write on the following topic: Sir Launfal at the castle gate on his return.

Second division 7 In speaking of Lord North's plan for conciliating the colonies Burke says, "First, then, I can not admit that proposition of a ransom by auction." State in substance the plan proposed, explain why Burke calls this plan a "ransom by auction" and give *two* of his arguments against it.

8 Explain the allusions in *three* of the following italicized expressions from *Macbeth:*

a We will establish our estate upon
Our eldest, Malcolm, whom we name hereafter
The Prince of Cumberland.

b Who's there, i' the name of *Beelzebub?*

c He is already nam'd, and gone to *Scone*
To be invested.

d Carried to *Colme-kill.*

e And at the pit of *Acheron*
Meet me i' the morning.

9 Show in detail how the murder of Duncan affected *a*) Macbeth, *b*) Lady Macbeth. Illustrate your answer by references to the play.

10 Write explanatory notes on *three* of the following from *L'allegro* and *Il penseroso:*

a In dark Cimmerian desert ever dwell.

b Then to the well-trod stage anon,
If Jonson's learned sock be on.

c And sable stole of cypress lawn
Over thy decent shoulders drawn.

d And the mute silence hist along
'Less Philomel will deign a song.

e Or call up him that left half-told
The story of Cambuscan bold.

11 Explain the meaning of *three* of the following from *Comus:*

a Square my trial
To my proportioned strength!

b Be not over-exquisite
To cast the fashion of uncertain evils.

c Yet, where an equal poise of hope and fear
Does arbitrate the event, my nature is
That I incline to hope.

d If you let slip time, like a neglected rose
It withers on the stalk with languished head.

e Coarse complexions
And cheeks of sorry grain will serve to ply
The sampler, and to tease the huswife's wool.

12 Give, from the *Essay on Milton*, Macaulay's explanation of the following statement:

Milton did not strictly belong to any of the classes which we have described. He was not a puritan. He was not a free-thinker. He was not a cavalier. In his character the noblest qualities of every party were combined in harmonious union.

High School Department

174TH EXAMINATION

COURSE IN ENGLISH READING

Friday, June 20, 1902 — 1.15 to 4.15 p. m., only

Answer eight questions but **no more.** *At least four questions must be chosen from the second division. Each answer under the first division will be considered a short (20 minute) theme and will be graded for composition. If more than eight questions are answered only the first eight answers will be considered. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

First division 1 Describe, from the *Princess*, the reconciliation between the Princess and Lady Psyche.

2 Write, from the *Merchant of Venice*, the story of Jessica.

3 Write, from *Sir Roger de Coverley Papers*, a description of Leonora's home.

4 Give a sketch of the story of the *Ancient Mariner*.

5 Describe, from the *Iliad*, the scene in which the gods decide that Hector's body shall be ransomed.

6 Relate, from the *Vicar of Wakefield*, the experiences of the Primrose family on their journey to their new home.

7 Give, from the *Last of the Mohicans*, a description of David Gamut.

8 Write on the following topic: Knighthood as represented in *Ivanhoe* and in the *Vision of Sir Launfal*.

Second division 9 Explain the meaning of *three* of the peculiar forms of expression italicized in the following from *Macbeth:*

a But the Norweyan lord *surveying vantage*,
With furbish'd arms and new supplies of men
Began a fresh assault.

b One of my fellows *had the speed* of him.

c If the assassination
Could trammel up the consequence, and catch
With his surcease success.

d Nor time nor place
Did then adhere, and yet you would make both.

e If't be so,
For Banquo's issue have I *filed my mind*.

10 Show by at least *two* detailed references to the play, the contrast between the character of Macbeth and that of Lady Macbeth.

11 Explain the meaning of the following from the *Conciliation with America*, with special reference to the italicized words:

> You will not think it unnatural that those who have *an object depending*, which strongly engages their hopes and fears, should be somewhat inclined to superstition. As I came into the House full of anxiety about the *event of my motion*, I found, to my infinite surprise, that the *grand penal bill*, by which we had passed sentence on the trade and sustenance of America, is to be returned to us from *the other House*.

12 Explain the allusions in *three* of the following italicized expressions from *Comus:*

a Neptune, besides the sway
Of every salt flood and each ebbing stream,
Took in, *by lot 'twixt high and nether Jove*,
Imperial rule of all the sea-girt isles.

b Who, ripe and frolic of his full-grown age,
Roving the *Celtic and Iberian fields*,
At last betakes him to this ominous wood.

c Offering to every weary traveler
His orient liquor in a crystal glass
To quench *the drouth of Phoebus*.

d They praise *the bounteous Pan*
And thank the gods amiss.

e By scaly *Triton's winding shell*.

13 Compare *L'allegro* with *Il penseroso* in *three* particulars, illustrating from the poems in each case.

14 Explain somewhat in detail what Macaulay means by the characteristic mentioned in the following quotation from the *Essay on Milton:*

> The most striking characteristic of the poetry of Milton is the extreme remoteness of the associations by means of which it acts on the reader.

15 Mention, from Macaulay's *Essay on Addison*, the three periodicals originated by Steele. Give the name of the one which was the greatest success, with reasons for its popularity.

High School Department

171ST EXAMINATION

ENGLISH SELECTIONS

Wednesday, September 25, 1901 — 1.15 to 4.15 p. m., only

Answer eight questions but **no more.** *If more than eight are answered only the first eight answers will be considered. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

1 Write, from the *Prologue*, *three* of the following in modern English:

a In curteisye was set ful muche hir lest.
b This ilke monk leet olde thinges pace.
c But sooth to seyn, I noot how men him calle.
d Anon he yaf the seke man his bote.
e Ye woot your forward, and I it yow recorde.

2 Give, from the *Prothalamion*, a description of the two swans and of their journey down the river Thames to London.

3 Give, from the *Tempest*, the story of Ariel.

4 Explain somewhat in detail the allusions in the following quotation from *Alexander's feast:*

He raised a mortal to the skies;
She drew an angel down.

5 Describe the opening scene in *Lines composed above Tintern abbey.*

6 Sketch the characters of the two brothers of the prisoner of Chillon and show how the imprisonment affected each of them.

7 Give, from the *Coming of Arthur*, an account of the coronation of King Arthur.

8 Give, from the *Holy grail*, the substance of what Arthur said when he learned of the vows taken by his knights.

9 Describe the encounter of Pheidippides with the great god Pan, on his return from Sparta.

10 Mention, from the essay on *Truth*, *three* reasons why Bacon believes that men favor lies.

11 Sketch briefly the events in England and America that led to the delivery of Burke's *Conciliation with the colonies.*

12 Give, from *Heroes and hero worship*, an account of *one* of the following: *a*) the expedition of Thor, the god of thunder, to Utgard, *b*) the *Koran*, *c*) the character of Luther.

High School Department

172D EXAMINATION

ENGLISH SELECTIONS

Wednesday, January 29, 1902 — 1.15 to 4.15 p. m., only

Answer eight questions but **no more.** *If more than eight are answered only the first eight answers will be considered. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

1 State the occasion that led Spenser to write the *Prothalamion.* Describe the plan of the poem.

2 State by whom and under what circumstances the following words were spoken and explain their meaning:

> We are such stuff
> As dreams are made on, and our little life
> Is rounded with a sleep.

3 Show how Dryden's selection of words is particularly effective in describing the music mentioned in the *Song for St Cecilia's day.*

4 Explain the allusions in the following from *Laodamia:*

> Thus, all in vain exhorted and reproved,
> She perished; and, as for a wilful crime,
> By the just gods whom no weak pity moved,
> Was doomed to wear out her appointed time,
> Apart from happy ghosts, that gather flowers
> Of blissful quiet 'mid unfading bowers.

5 Show how affection, resignation and pathos are portrayed in the *Prisoner of Chillon.*

6 Mention the successive steps taken by Leodogran to solve the mystery of Arthur's birth and give the result of each step.

7 Give an account of Percivale's sister and describe her vision of the holy grail.

8 Show, by references to the poem, the moral taught in *The boy and the angel.*

9 Write the story of Hervé Riel.

10 Give, from *Heroes and hero worship,* a summary of what Carlyle says concerning *one* of the following: Shakspere, Knox, Napoleon.

11 Give a sketch of Bacon's career as keeper of the great seal and as chancellor.

12 Write *two* quotations, containing at least *five* consecutive lines each, from one or more of the following: *Lines composed above Tintern abbey, Prisoner of Chillon, Holy grail, The lost leader.*

High School Department

174TH EXAMINATION

ENGLISH SELECTIONS

Wednesday, June 18, 1902 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Write in modern English *three* of the following from the *Prologue:*

a And wel we weren esed atte beste.
b This worthy man ful wel his wit bisette.
c And swich he was y-preved ofte sythes.
d His woning was ful fair up-on an heeth.
e Fayn wolde I doon yow mirthe, wiste I how.

2 Mention *three* facts concerning Spenser's life that may be learned from the *Prothalamion.*

3 Describe the first scene of the *Tempest* and show how this scene furthers the development of the plot.

4 Show in detail how the power of music is illustrated in *Alexander's Feast.*

5 Give a sketch of the life of Dryden and show how his writings were influenced by the age in which he lived.

6 Give, from *Lines composed above Tintern Abbey*, the substance of Wordsworth's tribute to his sister.

7 Explain the circumstances that led to *each* of the following conditions described by the prisoner of Chillon:

a Among the stones I stood a stone.
b But then by dull degrees came back
My senses to their wonted track.

8 Describe the dream that led Leodogran to consent to the marriage of Arthur and Guinevere.

9 Give an account of "The Siege Perilous" or Merlin's chair, and show its connection with the Knights of the Round Table.

10 Explain, either by detailed references to the poem or by quotations, the significance of the title *The lost Leader.*

11 Describe the interview of Pheidippides with the Spartans when he went to seek aid for Athens.

12 Give, from the *Essay on Bacon*, Macaulay's estimate of Bacon's character.

13 Give, from the *Conciliation with the Colonies*, the substance of what Burke says in regard to the way in which the spirit of liberty grew up in the colonies.

14 Give, from *Heroes and Hero Worship*, a sketch of what Carlyle says regarding *one* of the following: (*a*) paganism, (*b*) puritanism, (*c*) Dante's *Divine Comedy*.

15 Mention the work from which each of *two* of the following quotations is taken and explain the references in the quotations selected:

a Orpheus could lead the savage race,
And trees unrooted left their place,
Sequacious of the lyre;
But bright Cecilia raised the wonder higher.

b What doth she look on?—whom doth she behold?
Her hero slain upon the beach of Troy? . . .
And a God leads him, wingèd Mercury!

c That father perish'd at the stake
For tenets he would not forsake;
And for the same his lineal race
In darkness found a dwelling-place.

d At this hour
Lie at my mercy all mine enemies:
Shortly shall all my labors end, and thou
Shalt have the air at freedom: for a little
Follow, and do me service.

High School Department

171ST EXAMINATION

AMERICAN SELECTIONS

Tuesday, September 24, 1901—9.15 a. m. to 12.15 p. m., only

Answer eight questions but **no more.** *If more than eight are answered only the first eight answers will be considered. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

1 Describe the rescue of Uncas from the Huron encampment as given in the *Last of the Mohicans.*

2 Give, from the *House of the seven gables,* an account of Clifford's first breakfast at home.

3 State, from *Thanatopsis, two* reasons why death should not be dreaded, and give, by quotation or otherwise, an account of what Bryant says in regard to *one* of them.

4 Give, from *My garden acquaintance,* Lowell's criticism of White's *Natural history of Selborne.*

5 State by whom and under what circumstances the following was spoken and explain its meaning:

> What should we do in that small colony
> Of pinched fanatics, who would rather choose
> Freedom to clip an inch more from their hair,
> Than the great chance of setting England free?

6 State the theme of the *Hanging of the crane* and explain the significance of the title.

7 Give a sketch of Lar's life among the quakers and show their influence on him.

8 Give, from *Reveries of a bachelor,* an account of Paul's voyage to the fatherland.

9 Sketch, from the *Alhambra,* the story told by the soldier to Governor Manco.

10 Sketch the life of Longfellow.

11 Give an account of Franklin's efforts to put Philadelphia in a defensible condition.

12 Give, from the *Farewell address,* Washington's advice in regard to the attitude that should be taken toward foreign nations, touching on *one* of the following: *a*) impartiality of feeling, *b*) commercial relations.

High School Department

172D EXAMINATION

AMERICAN SELECTIONS

Tuesday, January 28, 1902 — 9.15 a. m. to 12.15 p. m., only

Answer eight questions but **no more.** *If more than eight are answered only the first eight answers will be considered. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

1 Mention *five* characters from the *Last of the Mohicans* and sketch a scene in which *two* of the characters selected appear.

2 Give, from the *House of the seven gables*, the connection of Colonel Pyncheon's portrait with the story.

3 Give an outline of *Thanatopsis.*

4 Connect *The present crisis* with a historical event and give from the poem *three* allusions to justify your answer.

5 Describe, from *My garden acquaintance*, *two* incidents showing Lowell's love for the birds and his keen observation of bird life.

6 Explain the meaning of the following quotation from the *Commemoration ode:*

> Weak-winged is song,
> Nor aims at that clear-ethered hight
> Whither the brave deed climbs for light:
> We seem to do them wrong,
> Bringing our robin's-leaf to deck their hearse
> Who in warm life-blood wrote their nobler verse.

7 Describe the encounter between Lars and the brother of Per.

8 Give, from *Reveries of a bachelor*, a description of the author's farm-house in the country and of his life while there.

9 Sketch the life of Irving, mentioning the sources from which he obtained material for the *Alhambra.*

10 Give, from the essay on *Nature*, a sketch of what Emerson says in regard to the influence of nature on man.

11 Give an account of the way in which Franklin brought about the establishment of a hospital in Philadelphia.

12 Write on *one* of the following topics: *a*) Scandinavian sports and customs as represented in *Lars*, *b*) Hawthorne's portrayal of character, *c*) Inhabitants of the Alhambra.

High School Department

174TH EXAMINATION

AMERICAN SELECTIONS

Tuesday, June 17, 1902—9.15 a. m. to 12.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Give an account of the arrival of Heyward and his companions at Fort William Henry.

2 Show, by references to the life and character of each, why Phoebe as a shopkeeper was more successful than Hepzibah Pyncheon.

3 Sketch the life of Bryant and mention *two* reasons why he has become famous in literature.

4 In the *Present Crisis* Lowell says, "New occasions teach new duties;" in *A Glance behind the Curtain* he says, "New times demand new measures and new men." Show that the underlying thought is the same in each quotation and state the special occasion to which each refers.

5 Mention, from *My Garden Acquaintance*, *five* birds that have left neighborhoods formerly occupied by them and give reasons for their disappearance.

6 Give, from the *Commemoration Ode*, the substance of Lowell's tribute to Lincoln.

7 Contrast the first picture with the last picture in the *Hanging of the Crane*.

8 Mention, from *Lars*, *three* traits of Norwegian character and illustrate each trait by reference to the poem.

9 Give, from *Reveries of a Bachelor*, an account of the author's trip in the Apennines.

10 Give a sketch of a legend connected with *one* of the following from the *Alhambra:* the tower of the princesses, the well of the Alhambra, the garden of Maumal.

11 Give, from the essay on *Nature*, the substance of what Emerson says concerning Indian summer.

12 Give an account of Franklin's father, showing how he influenced the development of Franklin's character.

13 Give, with special reference to the italicized expressions, the meaning of the following from the *Gettysburg Address:*

> We here highly resolve that *these dead shall not have died in vain*,—that this nation, under God, *shall have a new birth of freedom*,—and that government of the people, by the people, for the people, shall not perish from the earth.

14 State the connection of *each* of the following with the work from which each is taken: Uncle Venner, Brita, Montcalm, Bella, Mateo Ximenes.

15 Write *two* quotations, containing at least *five* consecutive lines each, from one or more of the following: *Thanatopsis*, *Commemoration Ode*, *Hanging of the Crane*, *Lars*.

High School Department

170TH EXAMINATION

FRENCH — First Year

August 1901 — Three hours, only

Answer questions 7 and 8 and eight of the others but **no more.** *If more than eight of the others are answered only the first eight answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–2 Translate into English:

VAN DYCK

Van Dyck était élève de Rubens. Un jour que ce dernier était sorti pour prendre l'air, Van Dyck et ses camarades s'approchent de deux tableaux que Rubens venait d'ébaucher. En se poussant mutuellement pour voir de plus près, l'un d'eux tombe sur les ébauches et les efface. Comment faire pour éviter les reproches du maître à son retour? "Il faut," dit l'un d'eux, "que le plus habile d'entre nous tâche de réparer ce malheur: je donne ma voix à Van Dyck." Ses camarades applaudissent. Van Dyck se met à l'œuvre. Il imite le mieux qu'il peut la manière de Rubens, qui revient au bout de trois heures. Rubens porte les yeux sur ce qu'il croit ses ébauches, et dit à ses élèves inquiets: "Ce n'est pas là ce que j'ai fait de plus mauvais en ma vie."

élève=pupil, *ébaucher*=sketch, *se pousser*=push oneself

3–4 Translate into English:

LE SACRE DE NAPOLÉON I

L'église de Notre-Dame était décorée avec une magnificence sans égale. Des tentures de velours, semées d'abeilles d'or, descendaient de la voûte jusqu'au sol. Au pied de l'autel, se trouvaient de simples fauteuils, que l'empereur et l'impératrice devaient occuper avant leur couronnement. Au fond de l'église, dans l'extrémité opposée à l'autel, un trône immense, élevé sur vingt-quatre marches, placé entre des colonnes qui supportaient un fronton, espèce de monument dans un monument, était destiné à l'empereur couronné et à son épouse. C'était l'usage dans les deux rites romain et français. Le monarque n'allait s'asseoir sur le trône qu'après avoir été couronné par le pontife.

sacre=coronation, *tenture*=hangings, *abeille*=bee, *marche*=step, *fronton*=pediment

5–6 Translate into English:

LA MARE AU DIABLE

L'enfant s'agenouilla sur la jupe de la jeune fille, joignit ses petites mains, et se mit à réciter sa prière, d'abord avec attention et ferveur, car il savait très bien le commencement; puis avec plus de lenteur et d'hésitation, et enfin répétant mot à mot ce que lui dictait la petite Marie, lorsqu'il arriva à cet endroit de son oraison, où le sommeil le gagnant chaque soir, il n'avait jamais pu l'apprendre jusqu'au bout. Cette fois encore, le travail de l'attention et la monotonie de son propre accent produisirent leur effet accoutumé, il ne prononça plus qu'avec effort les dernières syllabes, et encore après se les être fait répéter trois fois.

s'agenouiller=kneel down, *jupe*=skirt, *endroit*=place, *oraison*=prayer

7 Translate into French: *a*) I want neither her book nor yours, *b*) They did not rise till late, *c*) He is the tallest man in the room, *d*) When I spoke to him he only smiled, *e*) You will give me some flowers, will you not?

8 Write the second person singular and plural of *each* of the following verb forms: present indicative of *aller;* preterit (past-definite) of *vivre;* future of *pouvoir;* present subjunctive of *valoir;* imperfect subjunctive of *venir.* [Do not omit the pronouns.]

9 Write the second person singular of *être* in the indicative and subjunctive. Mention in each case the name of the tense.

10 Mention *three* different uses of the preposition *de* without the article with nouns, and illustrate each by a complete French sentence.

11 State *three* ways in which the feminine of adjectives may be formed from the masculine. Illustrate each.

12 Mention *three* idioms formed with *avoir* and use each correctly in a sentence.

13 Translate into French: *a*) This is the third time that I have sent for you, *b*) Edward the seventh is the king of England, *c*) He brought me a large and beautiful rose, *d*) I am afraid that it will rain, *e*) Shall you be at home tomorrow afternoon?

14 Write original French sentences illustrating the use of *a*) the comparative of the adjective *bon*, *b*) the preposition *en*, *c*) the adverb *y*, *d*) the subjunctive after an impersonal verb, *e*) an infinitive preceded by *de*.

15 Write from memory and translate at least 10 consecutive lines of any French poem.

University of the State of New York

High School Department

172D EXAMINATION

FRENCH—First Year

Monday, January 27, 1902—1.15 to 4.15 p. m., only

Answer questions 7 and 8 and eight of the others but **no more.** *If more than eight of the others are answered only the first eight answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–2 Translate into English:

LA BELLE AU BOIS DORMANT

Il traversa plusieurs chambres pleines d'hommes et de dames qui dormaient, les uns debout, les autres assis. Il entra dans une chambre toute dorée et il vit sur un lit le plus beau spectacle qu'il eût jamais vu: une princesse qui semblait être âgée de seize ans et dont la beauté était admirable. Il approcha en tremblant et en admirant, et s'agenouilla près d'elle.

Alors, comme la fin de l'enchantement était venue, la princesse s'éveilla. Elle regarda le prince avec un sourire très tendre pour une première vue et lui dit: "Est-ce vous, mon prince? Je vous ai attendu bien longtemps."

debout=standing, *s'agenouiller*=kneel

3–4 Translate into English:

À QUELQUE CHOSE MALHEUR EST BON

Un marchand retournait chez lui à cheval, ayant en croupe une valise qui contenait une somme d'argent considérable. Une forte pluie commença à tomber après qu'il se fut mis en route. Il était trempé jusqu'aux os et ne cessait de maudire le temps. Tout à coup, comme il traversait un bois, un bandit à pied parut devant lui, un fusil à la main, l'ajusta et pressa la détente. Mais la poudre était humide et le fusil rata. Le marchand éperonna alors son cheval et échappa au danger. "Quel sot j'étais," se dit-il, "de me plaindre du temps. Sans cette bonne pluie, que serais-je devenu? Les hommes ne savent pas toujours ce qui est bon pour eux."

en croupe = behind, *tremper* = wet, *ajuster* = aim, *détente* = trigger, *rater* = miss fire, *éperonner* = spur

5–6 Translate into English:

LA ROSE MOUSSEUSE

L'ange qui prend soin des fleurs, et qui, pendant la nuit, les trempe de rosée, s'était endormi un jour de printemps à l'ombre d'un rosier. Lorsqu'il s'éveilla, il dit, en le regardant avec bonté, "Je te remercie, toi, le plus cher de mes enfants, je te remercie de ton parfum bienfaisant et de ton ombrage qui rafraîchit. Aurais-tu encore quelque chose à me demander? Je te l'accorderais volontiers."

"Eh bien," dit le rosier, "donne-moi un nouvel ornement."

Et pour parure à la reine des fleurs, l'ange fit naître la simple mousse. Et ainsi s'éleva dans sa naïve beauté la rose mousseuse, la plus belle de son espèce.

tremper=water, *rosée*=dew, *ombrage*=shade, *parure*=ornament, *mousse*=moss

7 Translate into French: *a*) There is not a person in the room, *b*) He is the gayest man that I know, *c*) Please close the door. It is cold today, *d*) At night we could hear these sounds more distinctly, *e*) Who is that? It is I.

8 Conjugate *avoir* in the preterit (past definite) indicative active, *finir* in the imperfect indicative active, *se réjouir* in the past indefinite (compound of the present). [Do not omit pronouns.]

9 Write the masculine form of *pauvre*, *blanche*, *ancienne*, *secrète*, *active*, *malheureuse*, *vieille*, *publique*, *longue*, *fausse*.

10 Answer the following questions by original French sentences of at least six words each [Do not use figures]: *a*) Qui a sommeil? *b*) Combien de livres votre père a-t-il? *c*) Où est votre maison? *d*) Quel jour du mois avons-nous aujourd'hui?

11 Indicate, by the use of the proper article, the gender of *each* of the following nouns: *port*, *nature*, *raison*, *village*, *terre*, *liberté*, *juin*, *faim*, *dîner*, *fruit*.

12 Translate into English: *a*) Il avait un château à la campagne, *b*) Elle se piqua la main, *c*) J'ai à vous parler, *d*) Tout le monde était ici hier, *e*) C'est arrivé de temps en temps.

13 Write the principal parts (primitive tenses) of *chanter*, *sourire*, *craindre*, *tenir*.

14 State and illustrate *three* rules for the formation of the plural of nouns.

15 Write from memory and translate at least 10 consecutive lines of *one* of the following: *Le colimaçon*, *Trois fils d'or*, *Le petit Pierre*, *Etoiles filantes*.

University of the State of New York

High School Department

174TH EXAMINATION

FRENCH — First Year

Monday, June 16, 1902 — 1.15 to 4.15 p. m., only

Answer questions 7 and 8 and eight of the others but **no more.** *If more than eight of the others are answered only the first eight answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–2 Translate into English:

LE VILLAGE

Si nous sortons de la ville et si nous marchons plus ou moins longtemps sur la grande route, nous arrivons ordinairement à un village. Chaque villageois a ordinairement sa petite maison entourée d'un jardin et de quelques pièces de terre. Ceux qui sont trop pauvres pour avoir du terrain travaillent seulement pour les autres. Ce sont des ouvriers. Souvent aussi, il y a près du village un château entouré d'un grand parc. Le propriétaire de ce château a beaucoup de terres, de bois dans le pays. Il ne reste pas toujours là. Généralement il y vient, avec sa famille, pendant la belle saison, et l'hiver il retourne à la ville.

entourer=surround, *hiver*=winter

3–4 Translate into English:

CHRISTOPHE COLOMB

A deux heures après minuit la *Pinta*, qui était en avant, découvrit la terre; vous jugez avec quelle impatience on attendit le jour, avec quelle ardeur mêlée de curiosité on désirait contempler cette terre que chacun désespérait de jamais voir. Enfin, à la pointe du jour, ces gens, qui depuis trente-cinq jours de navigation n'avaient eu sous les yeux que le ciel et l'eau, aperçurent en face d'eux le spectacle ravissant de montagnes et de collines couvertes de la plus agréable verdure; à cette vue, Colomb chanta un Te Deum que l'équipage des trois navires répéta en chœur.

équipage=crew

5–6 Translate into English:

LA DISPUTE

Deux petits garçons, ayant trouvé une noix, se la disputèrent vivement. "Elle est à moi," dit l'un d'eux, "car c'est moi qui l'ai vue le premier." "Non, mon cher, elle m'appartient," répondit l'autre, "car c'est moi qui l'ai ramassée."

Ils en venaient déjà aux mains, lorsqu'un jeune homme, qui était témoin de la dispute, leur dit: "Venez, je vais vider votre querelle." Il se plaça entre les deux petits garçons, cassa la noix et dit: "L'une des coquilles appartient à celui qui le premier a vu la noix, l'autre sera pour celui qui l'a ramassée. Quant à l'amande, je la garde pour prix du jugement que j'ai rendu."

noix=walnut, *vider*=decide, *coquille*=shell, *amande*=kernel

7 Translate into French: (*a*) Put this on the table in the next room, (*b*) You were not at home this morning, (*c*) Give them to him, (*d*) Ney was the best general that Napoleon had, (*e*) Do you not believe it? No, I doubt it very much.

8 Conjugate, in the plural, *être* in the preterit (past definite) indicative, *porter* in the present subjunctive active, *se défendre* in the imperfect indicative. [Do not omit the pronouns.]

9 Write the possessive adjectives, indicating in each case the gender and the number.

10 Translate into English: (*a*) N'importe. Ce n'est rien, (*b*) Je me suis coupé le doigt, (*c*) J'ai mal aux dents, (*d*) Le soleil se lève à six heures, (*e*) Il sait tout mettre à profit.

11 State and illustrate the general rule for the comparison of adjectives. Mention and compare *two* adjectives that are exceptions to the rule.

12 Translate into French: (*a*) There are many people in the street, (*b*) I am glad that you did it, (*c*) No one has lost anything, (*d*) You were living at Toulon at the time, (*e*) Sit down by my side.

13 Write the masculine plural of *jolie*, *honnête*, *bonne*, *nouvelle*, *chère*.

14 Write the present active participle and the past participle of *rendre*, *servir*, *prendre*, *savoir*, *croire*.

15 Write from memory and translate at least 10 consecutive lines of *one* of the following: *Trois fils d'or*, *Partant pour la Syrie*, *La petite mendiante*, *La tombe dit à la rose*.

High School Department

172D EXAMINATION

FRENCH — Second Year

Monday, January 27, 1902 — 9.15 a. m. to 12.15 p. m., only

Answer questions 7 and 12 and eight of the others but **no more.** *If more than eight of the others are answered only the first eight answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–2 Translate into English:

TROIS MOUSQUETAIRES

L'hôte, en voyant un jeune homme suivi d'un laquais et de deux chevaux de main, s'avança respectueusement sur le seuil de la porte. Or, comme il avait déjà fait onze lieues, d'Artagnan jugea à propos de s'arrêter, que Porthos fût ou ne fût pas dans l'hôtel. Puis peut-être n'était-il pas prudent de s'informer du premier coup de ce qu'était devenu le mousquetaire. Il résulta de ces réflexions que d'Artagnan, sans demander aucune nouvelle de qui que ce fût, descendit, recommanda les chevaux à son laquais, entra dans une petite chambre destinée à recevoir ceux qui désiraient être seuls, et demanda à son hôte une bouteille de son meilleur vin et un déjeuner aussi bon que possible. — *Dumas*

cheval de main = led horse

3–4 Translate into English:

TARTARIN DE TARASCON

C'était un grand désert sauvage, tout hérissé de plantes bizarres, de ces plantes d'orient qui ont l'air de bêtes méchantes. Sous le jour discret des étoiles, leur ombre agrandie s'étirait par terre en tous sens. A droite, la masse confuse et lourde d'une montagne, l'Atlas peut-être! . . . A gauche, la mer invisible, qui roulait sourdement . . . Un vrai gîte à tenter les fauves . . .

Un fusil devant lui, un autre dans les mains, Tartarin de Tarascon mit un genou en terre et attendit . . . Il attendit une heure, deux heures . . . Rien! . . . Alors il se souvint que, dans ses livres, les grands tueurs de lions n'allaient jamais à la chasse sans emmener un petit chevreau qu'ils attachaient à quelques pas devant eux et qu'ils faisaient crier en lui tirant la patte avec une ficelle. — *Daudet*

gîte = lodging, *fauve* = deer, *chevreau* = kid, *ficelle* = string

5–6 Translate into English:

TOUR DU MONDE EN QUATRE-VINGTS JOURS

La locomotive siffla vigoureusement. Le mécanicien, renversant la vapeur, ramena son train en arrière pendant près d'un mille, reculant comme un sauteur qui veut prendre son

élan. Puis, à un second coup de sifflet, la marche en avant recommença: elle s'accéléra; bientôt la vitesse devint effroyable. On sentait, pour ainsi dire, que le train tout entier, marchant avec une rapidité de cent milles à l'heure, ne pesait plus sur les rails. La vitesse mangeait la pesanteur.

Et l'on passa! Et ce fut comme un éclair. On ne vit rien du pont. Le convoi sauta, on peut le dire, d'une rive à l'autre.

Mais à peine le train avait-il franchi la rivière, que le pont, définitivement ruiné, s'abîmait avec fracas dans le rapide de Medicine Bow.—*Verne*

convoi=train, *s'abîmer*=be swallowed up

7 Translate into French: *a*) The oldest of the princes was born in the hut of a peasant, *b*) I wish that you would leave me at your house, *c*) Sit down and let us talk the matter over, *d*) I do not doubt that you are right, *e*) He will know nothing of it.

8 Conjugate, in the singular, *admirer* in the present conditional active, *joindre* in the imperfect indicative active, *manger* in the imperfect indicative active, *voir* in the preterit (past definite) active, *s'abattre* in the present subjunctive.

9 Compare the French words meaning *good*, *well*, *bad*, *little*, *new*.

10 Translate into English: *a*) Je vous en réponds, *b*) Que c'est beau, *c*) Il est de ma connaissance, *d*) Il y a un siècle, *e*) Il n'est plus temps, *f*) Il était allé faire une promenade en mer, *g*) Vous voilà prévenu, *h*) Il se trouvait près de là, *i*) Mais aucune réponse ne vint, *j*) Il faisait enfin grand jour.

11 Explain the difference in use between the conjunctive and the disjunctive personal pronouns. Write French sentences illustrating *a*) *two* uses of the conjunctive personal pronouns, *b*) *three* uses of the disjunctive personal pronouns.

12 Translate into French: *a*) He was looking out of the window when a slight sound attracted his attention, *b*) Everybody is standing, waiting patiently for the service to begin, *c*) Come, we can wait no longer, *d*) He asked if I had time, *e*) He used to live in the United States.

13 Distinguish in meaning *a*) *venir à* with the infinitive and *venir de* with the infinitive, *b*) *laisser* with the infinitive and *laisser de* with the infinitive, *c*) *sauver* and *se sauver*, *d*) *temps* and *fois*, *e*) *tout à coup* and *tout d'un coup*.

14 Write all the infinitives and participles, active and passive, of *finir*. Conjugate the imperative active of *finir*.

15 Write from memory and translate at least 10 consecutive lines of *one* of the following: *Adieux de Marie Stuart*, *Le corbeau et le renard*, *Adieu*, *Le vase brisé*.

High School Department

174TH EXAMINATION

FRENCH—Second Year

Monday, June 16, 1902—9.15 a. m. to 12.15 p. m., only

Answer questions 7 and 8 and eight of the others but **no more.** *If more than eight of the others are answered only the first eight answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–2 Translate into English:

LE ROI DES MONTAGNES

Les études de ma jeunesse ont développé en moi une passion qui a fini par empiéter sur toutes les autres: c'est le désir de savoir, ou, si vous aimez mieux l'appeler autrement, la curiosité. Jusqu'au jour où je partis pour Athènes, mon seul plaisir avait été d'apprendre; mon seul chagrin, d'ignorer. J'aimais la science comme une maîtresse, et personne n'était encore venu lui disputer mon cœur. En revanche, il faut convenir que je n'étais pas tendre, et que la poésie et moi entraient rarement par la même porte. Je me promenais dans le monde, comme dans un vaste muséum, la loupe à la main.—*About*

empiéter=encroach, *maîtresse*=sweetheart, *loupe*=magnifying-glass

3–4 Translate into English:

L'ABBÉ CONSTANTIN

Elles avaient déjà fait une promenade à pied, dans le parc. Elles se promettaient de faire, le lendemain, une longue promenade à cheval dans la forêt. Monter à cheval, c'était leur passion, leur folie! Et c'était aussi la passion de Jean, si bien qu'au bout d'un quart d'heure, on le priait d'être de cette promenade du lendemain. Il acceptait avec joie. Personne, mieux que lui, ne connaissait les environs: c'était son pays. Il serait si heureux de leur en faire les honneurs et de leur montrer une foule de petits endroits ravissants, que jamais, sans lui, elles ne sauraient découvrir!—*Halévy*

5–6 Translate into English:

MADEMOISELLE DE LA SEIGLIÈRE

Destournelles—La reconnaissance, monsieur, est pareille à cette liqueur d'orient, dont parlent les voyageurs, qui ne se conserve que dans des vases d'or; elle parfume les grandes

âmes et s'aigrit dans les petites. Au bout d'un an, il n'était pas plus question du vieux Stamply que s'il n'eût jamais existé. Il mourut oublié dans la maison du garde, où on l'avait relégué, sans proférer une plainte contre les ingrats qui l'avaient repoussé, heureux de quitter cette terre, si justement appelée le bas monde, et d'aller rejoindre là-haut sa femme et son fils dont il murmura le nom dans son dernier soupir.—*Sandeau*

7 Translate into French: (*a*) It was said that the republic could not last much longer, (*b*) If the river should rise, there would be no hope of escape, (*c*) Before you do this, reflect well, (*d*) When the days grow shorter, the birds will fly to the south, (*e*) Do so.

8 Translate into French: (*a*) It happened all of a sudden, (*b*) It is too bad, (*c*) There it is in front of you, (*d*) She lay down and slept till daybreak, (*e*) Come back and obey your father.

9 Conjugate, in the singular, *plaire* in the present subjunctive and the imperfect subjunctive, *aller* in the present indicative and the preterit (past definite) indicative, *rendre* in the imperative active.

10 Explain the following uses of *que:* as a relative pronoun, as an interrogative pronoun, as a means of avoiding the repetition of a preceding conjunction. Write and translate original French sentences illustrating each use.

11 Write the feminine of *père*, *frère*, *comte*, *duc*, *acteur*, *enchanteur*, *empereur*, *roi*, *ami*, *homme*.

12 State and illustrate *two* rules for the formation of adverbs. Compare *mal*, *peu*.

13 Write in French [Do not use figures]: quarter past nine, eleven o'clock, late in the afternoon, from midday to midnight.

14 Write the second person plural of *each* of the tenses of the indicative and of the subjunctive of *douter*. [Mention in each case the mode and tense.]

15 Write from memory and translate at least 10 consecutive lines of *one* of the following: *Adieu*, *La cigale et la fourmi*, *Chanson de Fortunio*, *La source*.

High School Department

172D EXAMINATION

FRENCH — Third Year

Monday, January 27, 1902 — 1.15 to 4.15 p. m., only

Answer questions 7 and 13 and eight of the others but **no more.** *If more than eight of the others are answered only the first eight answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–2 Translate into English:

HORACE

Sabine — Flatteuse illusion, erreur douce et grossière,
Vain effort de mon âme, impuissante lumière,
De qui le faux brillant prend droit de m'éblouir,
Que tu sais peu durer, et tôt t'évanouir!
Pareille à ces éclairs qui, dans le fort des ombres,
Poussent un jour qui fuit et rend les nuits plus sombres,
Tu n'as frappé mes yeux d'un moment de clarté
Que pour les abîmer dans plus d'obscurité.
Tu charmais trop ma peine; et le ciel, qui s'en fâche,
Me vend déjà bien cher ce moment de relâche.
Je sens mon triste cœur percé de tous les coups
Qui m'ôtent maintenant un frère, ou mon époux. — *Corneille*

fort=depth

3–4 Translate into English:

LE MISANTHROPE

Arsinoé—Vous voyez, elle veut que je vous entretienne,
Attendant un moment que mon carrosse vienne;
Et jamais tous ses soins ne pouvaient m'offrir rien
Qui me fût plus charmant qu'un pareil entretien.
En vérité, les gens d'un mérite sublime
Entraînent de chacun et l'amour et l'estime;
Et le vôtre sans doute a des charmes secrets
Qui font entrer mon cœur dans tous vos intérêts.
Je voudrais que la cour, par un regard propice,
A ce que vous valez rendît plus de justice.
Vous avez à vous plaindre; et je suis en courroux,
Quand je vois chaque jour qu'on ne fait rien pour vous.
— *Molière*

5–6 Translate into English:

NOTRE DAME DE PARIS

Tout à coup il entendit craquer les ais de l'escalier de bois; quelqu'un montait. La trappe se rouvrit; une lumière reparut. Il y avait à la porte vermoulue de son bouge une fente assez

large; il y colla son visage. De cette façon il pouvait voir tout ce qui se passait dans la chambre voisine. La vieille à face de chat sortit d'abord de la trappe, sa lampe à la main: puis Phœbus retroussant sa moustache, puis une troisième personne, cette belle et gracieuse figure, la Esmeralda. Le prêtre la vit sortir de terre comme une éblouissante apparition. Claude trembla, un nuage se répandit sur ses yeux, ses artères battirent avec force, tout bruissait et tournait autour de lui; il ne vit et n'entendit plus rien.—*Hugo*

ais = plank, *vermoulu* = worm-eaten, *bouge* = closet, *coller* = glue

7 Translate into French: *Quatre-vingt-treize* presents an episode of the war in the Vendée. That terrible period is described forcibly and impartially. We perceive the poet through the novelist in that charming chapter in which two children play peacefully on while the castle in which they are shut is burning.

8 Write the third person singular of the future indicative and present subjunctive of *aller*, *s'asseoir*, *s'étonner*, *pouvoir*, *vivre*.

9 Write and translate a French sentence illustrating *each* of the following: *two* ways of avoiding the use of the passive voice, *two* uses of the present tense, the difference between the imperfect and preterit (past definite) tenses.

10 Translate into French: *a*) He is lost after all, *b*) They had to give themselves up, *c*) The king went by on horseback, *d*) That is all right, *e*) He began to work early in the morning, *f*) He went away slowly, *g*) For a long time he thought of it, *h*) He took a walk in the woods, *i*) Show him in, *j*) Remain there.

11 State *two* uses of the conditional mode, *three* uses of the subjunctive mode. Illustrate by original French sentences of at least six words each.

12 Write about 75 words on the life and works of *one* of the following: Molière, Sand, Dumas père.

13 Write in French a letter of at least 60 words, describing to your absent brother some event that has recently happened in your town.

14 Conjugate *suivre* interrogatively in the present indicative active and in the imperfect indicative active; *pourvoir* negatively in the future indicative active and in the present subjunctive active.

15 Write from memory and translate at least 10 consecutive lines of *one* of the following: *L'écho*, *La mort de Jeanne d'Arc*, *Le chêne et le roseau*, *Mes bœufs*.

High School Department

174TH EXAMINATION

FRENCH — Third Year

Monday, June 16, 1902 — 1.15 to 4.15 p. m., only

Answer questions 7 and 8 and eight of the others but **no more.** *If more than eight of the others are answered only the first eight answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–2 Translate into English:

ATHALIE

Josabeth — A vos sages conseils, seigneur, je m'abandonne.
Du jour que j'arrachai cet enfant à la mort,
Je remis en vos mains tout le soin de son sort;
Même, de mon amour craignant la violence,
Autant que je le puis j'évite sa présence,
De peur qu'en le voyant quelque trouble indiscret
Ne fasse avec mes pleurs échapper mon secret.
Surtout j'ai cru devoir aux larmes, aux prières,
Consacrer ces trois jours et ces trois nuits entières.
Cependant aujourd'hui puis-je vous demander
Quels amis vous avez prêts à vous seconder?
Abner, le brave Abner, viendra-t-il nous défendre? — *Racine*

3–4 Translate into English:

LE BOURGEOIS GENTILHOMME

Le maître à danser — Il y a plaisir, ne m'en parlez point, à travailler pour des personnes qui soient capables de sentir les délicatesses d'un art, qui sachent faire un doux accueil aux beautés d'un ouvrage, et, par de chatouillantes approbations, vous régaler de votre travail. Oui, la récompense la plus agréable qu'on puisse recevoir des choses que l'on fait, c'est de les voir connues, de les voir caressées d'un applaudissement qui vous honore. Il n'y a rien, á mon avis, qui nous paye mieux que cela de toutes nos fatigues; et ce sont des douceurs exquises que des louanges éclairées. — *Molière*

chatouiller = gratify

5–6 Translate into English:

LES MISÉRABLES

Voilà bien des années déjà que l'auteur de ce livre, forcé, à regret, de parler de lui, est absent de Paris. Depuis qu'il l'a quitté, Paris s'est transformé. Une ville nouvelle a surgi qui lui est en quelque sorte inconnue. Il n'a pas besoin de dire qu'il aime Paris; Paris est la ville natale de son esprit. Par suite des démolitions et des reconstructions, le Paris de sa

jeunesse, ce Paris qu'il a religieusement emporté dans sa mémoire, est à cette heure un Paris d'autrefois. Qu'on lui permette de parler de ce Paris-là comme s'il existait encore. Il est possible que là où l'auteur va conduire les lecteurs en disant: "Dans telle rue il y a telle maison," il n'y ait plus aujourd'hui ni maison ni rue.—*Hugo*

7 Translate into French: Le Sage did not proceed, as Cervantes would have done, to reform the bad taste of his compatriots. He did not exaggerate the faults that he sought to condemn. On the contrary he wrote a book, *Gil Blas*, every page of which is a masterpiece of naturalness and truth.

8 Write in French at least 75 words, outlining some French story that you have read.

9 Conjugate, in the plural, *vaincre* in the present indicative active, the future indicative active, the preterit (past definite) indicative active; *vouloir* in the present subjunctive active and the imperfect subjunctive active.

10 Distinguish in use (*a*) *ne . . . pas*, *ne . . . point*, (*b*) *Je ne peux* and *Je ne peux pas*. State the orthographic change that takes place in conjugation in the stem of *each* of the following: *mener*, *céder*, *jeter*, *manger*, *placer*, *payer*.

11 Translate into French: (*a*) He was there scarcely an hour before me, (*b*) Without saying anything the accused remained standing before his judge, (*c*) Sit down till you are rested, (*d*) We have lived here for three years, (*e*) Stay at our house for a week.

12 Mention *five* feminine terminations of nouns denoting inanimate objects. Write and translate nouns having the terminations mentioned.

13 Write in French about 75 words on the life, character and works of *one* of the following: *Racine*, *Voltaire*, *Mérimée*.

14 Write the masculine singular and the feminine singular of the past participle of *croître*, *absoudre*, *aller*, *souffrir*, *partir*.

15 Write from memory and translate at least 10 consecutive lines of *one* of the following: *Le chêne et le roseau*, *Les souvenirs du peuple*, *La Marseillaise*, *L'écho*.

University of the State of New York

High School Department

170TH EXAMINATION

GERMAN — First Year

August 1901 — Three hours, only

Answer questions 7 and 8 and eight of the others but **no more.** *If more than eight of the others are answered only the first eight answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–2 Translate into English:

EINE FRAGE

Das Meer und der Himmel und die lichte Sonne und alles, was schön und glänzend in der Nähe und Ferne, spiegelte sich in ihren Herzen und es war ihnen beiden, als vernähmen sie alles, was singt und klingt und lacht und jubelt, mit ihrem innern Ohr. Jedes von ihnen meinte in dem andern die ganze Welt mit all ihrer Lust und all ihrem Glück zu besitzen. Sie waren eins, ganz eins, und auſser ihnen gab es nichts weiter, und so wurden sie für einander zu einer besondern seligen Welt, neben der alles andere Geschaffene ins Nichts sank.

3–4 Translate into English:

DEUTSCHE LIEBE

Die Kindheit hat ihre Geheimnisse und ihre Wunder — aber wer kann sie erzählen, und wer kann sie deuten? Wir sind alle durch diesen stillen Wunderwald gewandert — wir haben alle einst in seliger Betäubung die Augen geöffnet, und die schöne Wirklichkeit des Lebens überflutete unsere Seele. Da wuſsten wir nicht, wo wir waren und wer wir waren — da war die ganze Welt unser, und wir gehörten der ganzen Welt. Das war ein ewiges Leben — ohne Anfang und ohn' Ende — ohne Stillstand, ohne Schmerz. Im Herzen war es hell wie Frühlingshimmel, frisch wie Veilchenduft — still und heilig wie ein Sonntagsmorgen.

deuten = explain, *Betäubung* = confusion, *überfluten* = overflow

5–6 Translate into English:

DIE ALTE GOUVERNANTE

Ich muſs dazu wohl ein wenig geseufzt haben, denn sie sah mich mit den guten freundlichen Augen eine Weile an und

sagte: "Ich bin ganz ruhig und heiter, Kindchen, denn alles ist fertig, und das übrige steht in Gottes Hand. Sollte es, wie mir meine Ahnung sagt, nicht glücklich ablaufen, so habe ich in den letzten acht Tagen so nach und nach, denn viel kann ich ja nicht leisten, wie du weiſst, alles vorbereitet, daſs niemand eine Last davon hat, und alles wie am Schnürchen gehen wird."

heiter = cheerful, *Ahnung* = presentiment, *ablaufen* = end, *leisten* = do, *Last* = burden

7 Translate into German:

a I came because you called me.

b There is still time for you to write.

c The sooner you go the better.

d What is your name?

e Who will meet you when you return?

8 Conjugate, in the singular, the present indicative of *mögen*, the imperfect indicative of *wachsen*, the present subjunctive active of *essen*, the imperfect subjunctive active of *arbeiten*. Write the imperative active of *sehen*.

9 Decline in the singular the German for *the green tree;* in the plural the German for *our best friends*.

10 Write the synopsis of *lieben* in the first person singular of the indicative and subjunctive passive. Mention in each case the name of the tense.

11 Write the principal parts of *ausbreiten*, *erfassen*, *schweigen*, *lesen*, *empfehlen*.

12 Compare *gut*, *gern*. Mention *two* ways in which adverbs may be formed and illustrate each.

13 Translate into German: *a*) We shall be there a week from today, *b*) He did it in order to please me, *c*) If you are wrong confess it, *d*) He told me about it only just now, *e*) Which is the street on which you live?

14 Mention *three* adjectives that are followed by the dative; *two* adjectives that are followed by the genitive. Write a complete German sentence illustrating each.

15 Write from memory and translate at least 10 consecutive lines of any German poem.

High School Department

171ST EXAMINATION

GERMAN—First Year

Tuesday, September 24, 1901—9.15 a. m. to 12.15 p. m., only

Answer questions 7 and 8 and eight of the others but **no more.** *If more than eight of the others are answered only the first eight answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–2 Translate into English:

GUDRUN

Um dieselbe Zeit nun lebte in einem Lande ganz nahe bei König Hettels Land ein junger, mutiger König mit Namen Herwig. Auch er hatte von Gudrun gehört und wuſste, wie schön sie war, und wollte sie sich zum Weibe gewinnen. Deshalb zog er eines Tages, von vielen stattlichen Rittern begleitet, nach dem Königshofe zu Norwegen hin und wurde daselbst gar freundlich empfangen und gebeten, er möge doch eine Weile verbleiben. Nun nahm Herwig an allen Ritterspielen teil, und König Hettel sowohl wie dessen Gemahlin, die Königin Hilde, fanden Wohlgefallen an dem jungen, tapfern König.

Wohlgefallen=pleasure

3–4 Translate into English:

DIE BOTEN DES TODES

Vor alten Zeiten wanderte einmal ein Riese auf der groſsen Landstraſse; da sprang ihm plötzlich ein unbekannter Mann entgegen und rief: "Halt! Keinen Schritt weiter!"—"Was," sprach der Riese, "du Wicht, den ich zwischen den Fingern zerdrücken kann, du willst mir den Weg vertreten? Es ist erstaunlich, was du keck redest. Wer bist du denn?" "Ich bin der," erwiderte der andere, "dem niemand widersteht. Wem ich befehle, der muſs mir gehorchen, auch du; denn ich bin der Tod!"

Der Riese aber fing an mit dem Tode zu ringen. Es war ein langer, heftiger Kampf. Zuletzt schlug der Riese mit seiner Faust den Tod nieder, daſs er neben einem Steine liegen blieb.

Bote=messenger, *Riese*=giant, *Landstraſse*=highway, *Wicht* =creature, *keck*=saucily, *ringen*=struggle

5–6 Translate into English:

ANFANG UND ENDE

Der Knabe zögerte. "Wer sind Sie denn?" fragte er.

"Ein alter Freund deiner Mutter. Du kannst mir schon die Hand geben, die Mutter hat nichts dagegen. So, das ist brav, mein Junge. Willst du mich einmal besuchen? Ich habe vier schöne Pferde. Und eine kleine Flinte schenke ich dir und nehme dich mit auf die Jagd, und wenn du deinen ersten Hasen geschossen hast, bringst du ihn der Mutter."

Die Augen des Knaben funkelten. Dann wurde er plötzlich nachdenklich und sagte: "Ich käme gern zu Ihnen, aber ich mufs in die Schule. Nur heute noch habe ich frei, und eben fragten mich die beiden Söhne des Direktors, ob ich mit ihnen vor die Stadt will, einen Drachen steigen zu lassen."

zögern = hesitate, *Flinte* = gun, *nachdenklich* = thoughtful, *einen Drachen steigen lassen*=fly a kite

7 Translate into German: *a*) Next week I shall see the child of whom you speak, *b*) He said that he had never heard of such a book, *c*) We went at once to the city, *d*) He permitted me to come into the garden, *e*) Look at that tall soldier.

8 Conjugate, in the singular, the present indicative of *sich erinnern*, the pluperfect indicative of *sein*, the imperfect subjunctive active of *reden*, the future subjunctive passive of *gehorchen*, the perfect indicative passive of *rufen*.

9 Decline, in the singular, *der gröfsere Vogel*, *ein*, *du*.

10 Write the synopsis of *haben* in the third person singular of the active voice.

11 Write the principal parts of *brennen*, *wachsen*, *pflegen*, *liegen*, *schreien*.

12 Compare *viel*, *hoch*, *hart*. Write the second and the third person singular of the present indicative active of *helfen*, *lesen*.

13 Mention *three* prepositions that are followed by *either* the dative *or* the accusative; *two* prepositions that are followed by *either* the genitive *or* the dative. Illustrate each by an original German sentence.

14 Translate into German: *a*) In the evening I take a drive, *b*) She is tired and homesick, *c*) It is half past twelve, *d*) You have my word for it, *e*) I have said so many a time.

15 Write from memory and translate 10 consecutive lines of *any* German poem.

University of the State of New York

High School Department

172D EXAMINATION

GERMAN—First Year

Tuesday, January 28, 1902—9.15 a. m. to 12.15 p. m., only

Answer questions 7 and 8 and eight of the others but **no more.** *If more than eight of the others are answered only the first eight answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–2 Translate into English:

KAISER WILHELM I

Kaiser Wilhelm I wurde am 22. März 1797 geboren. Er war immer fleiſsig beim Studieren und machte seinen Eltern und Lehrern viel Freude. Seine Dankbarkeit gegen seine Lehrer sieht man aus einem Briefe, welchen er 1809 an seinen früheren Lehrer Zeller in Königsberg schrieb. Dieser Brief ist ferner interessant als das älteste vorhandene Schreiben des Kaisers. Er sagte: "Lieber Vater Zeller! Ich danke dir von ganzem Herzen für das Gute, daſs du mir erwiesen hast. Ich denke oft mit Freuden an die Tage, die wir in deiner Schule zugebracht haben, und besonders an den letzten. Ich bitte dich, die ganze Schule zu grüſsen. Lebe wohl, lieber Vater! Dein dich liebender Sohn Wilhelm."

ferner=besides, *vorhanden*=extant, *zubringen*=spend

3–4 Translate into English:

DIE CHRISTWURZ

Die Sonne war bereits untergegangen, nur die Spitzen der Berge glänzten noch rotgolden, im Thal hatte die Dämmerung bereits ihre grauen Nebeltücher über die Schneefelder gebreitet. Kein lebendes Geschöpf war sichtbar, nur zwei Krähen zogen mit langsamen Flügelschlägen waldeinwärts. Ganz in der Ferne schimmerte ein Licht durch den Nebel, das kam von den erleuchteten Fenstern der Klosterkirche, und dem Lichtschein nach über den knirschenden Schnee schritt die Mutter mit angsterfülltem Herzen.

Christwurz=Christmas rose, *Nebeltuch*=garment of mist, *Geschöpf*=creature, *Krähe*=crow, *knirschen*=creak

5–6 Translate into English:

DEUTSCHE LIEBE

Die Wolken am Himmel der Kindheit dauern nicht lange, und nach einem kurzen, warmen Thränenregen sind sie verschwunden. So war ich bald wieder auf dem Schlosse, und die Fürstin gab mir ihre Hand, die ich küssen durfte, und dann brachte sie ihre Kinder, die jungen Prinzen und Prinzessinen, und wir spielten zusammen, als hätten wir uns schon seit Jahren gekannt. Das waren glückliche Tage, wenn ich nach der Schulzeit—denn ich ging nun schon in die Schule—auf das Schlofs gehen durfte, um zu spielen.

dauern=last

7 Translate into German: *a*) Come to me at half past five, *b*) I should like to talk to you, *c*) If you wish, he will go with you, *d*) The boy will be praised by his teacher, *e*) Why do you not wait till it stops raining?

8 Conjugate, in the singular, the imperfect indicative active and the imperfect subjunctive active of *nehmen*, the future indicative active of *beginnen*, the present indicative passive of *geben*, the pluperfect indicative passive of *sagen*.

9 Indicate the gender and the accent of each of *five* of the following nouns: *Soldat*, *Leben*, *Freundin*, *Schmeichelei*, *Professor*, *Antwort*, *Apfelbaum*, *Gelegenheit*.

10 Decline, in the singular, *der schöne Tag;* in the plural, *unser kleines Pferd.*

11 Write the principal parts of *reiten*, *einfallen*, *geschehen*, *rufen*, *waschen*.

12 Write the synopsis of *mögen* in the third person singular.

13 Translate into English: *a*) Er weifs nicht was er will, *b*) Die Schuld liegt nicht an mir, *c*) Ich bin Ihnen sehr dankbar, *d*) Dies bleibt noch zu thun, *e*) Was kann ich dafür?

14 Write original German sentences containing *a*) an indeclinable word, *b*) a possessive pronoun used substantively, *c*) an ordinal numeral, *d*) a subjunctive of wish, *e*) an infinitive used substantively.

15 Write from memory and translate at least 10 consecutive lines of *one* of the following: *Der Wirtin Töchterlein*, *Schwertlied*, *Sinnsprüche*, *Du, du, liegst mir am Herzen.*

High School Department

173D EXAMINATION

GERMAN—First Year

Wednesday, March 26, 1902—9.15 a. m. to 12.15 p. m., only

Answer questions 7 and 8 and eight of the others but **no more.** *If more than eight of the others are answered only the first eight answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–2 Translate into English:

DAS MÄRCHEN OHNE ENDE

Das Kind wuſste nicht recht, was es zu allem dem sagen sollte; sinnend ging es zurück, legte sich in sein Bettchen und traümte die ganze Nacht von dem Meer und den Sternen und dem dunkelen Berge. Der Mond aber betrachtete gar zu gerne das schlummernde Kind, wie es mit dem Köpflein auf das rechte Aermchen sanft hingelehnt dalag. Er blieb lange vor dem kleinen Fenster stehen und ging nur zögernd weiter, um auch einigen Kranken das dunkle Kämmerlein zu erhellen. Wie nun des Mondes sanftes Licht auf des Kindes Augen ruhte, kam es ihm vor, als sitze es in einem goldenen Kahne auf einem groſsen, groſsen Wasser.

betrachten = look at, *hinlehnen* = rest on, *zögern* = linger, *Kammer* = room

3–4 Translate into English:

VOM UNSICHTBAREN KÖNIGREICHE

Darauf ging der König der Träume voran und Jörg folgte ihm. Als sie an die Stelle kamen, wo die Wolken auf die Erde hingen, wies der König auf eine Fallthüre, welche so versteckt im Busch lag, daſs sie gar nicht zu finden war, wenn man es nicht wuſste. Er hob sie auf und führte seinen Begleiter fünfhundert Stufen hinab in eine hell erleuchtete Grotte, welche sich meilenweit in wunderbarer Pracht hinzog. Es war unsäglich schön! Da waren Schlösser auf Inseln mitten in groſsen Seen, und die Inseln schwammen umher wie Schiffe.

Fallthüre = trapdoor, *Stufe* = step, *erleuchten* = light up, *sich hinziehen* = extend

5–6 Translate into English:

DER BRENNENDE WALD

In tiefen Thälern war es noch ruhig, da hörte man nichts als das leise Flüstern der hohen Tannen, aber der nächtliche Himmel war rosig und zuweilen flog hoch oben ein Feuerdrache dahin. Dann wieder kam eine zwitschernde Vogelschar und die heimatlosen Tierchen schossen planlos umher, und die Rehe und Hirsche kamen erschreckt heran zu den Menschenwohnungen.

"Wie diesen Tieren geht's uns allen!" klagte ein Weib; "keine Menschenmöglichkeit, daſs der Wald gerettet wird—alles brennt, alles brennt!"

Drache = dragon, *zwitschern* = twitter, *Schar* = flock, *Reh* = doe

7 Translate into German:

a You must not have such a coat made.

b I am going to meet my little sister.

c Last Thursday it snowed all day.

d Why do you boast of your money?

e Did you not believe me?

8 Conjugate, in the singular, the present indicative of *schlafen*, the imperfect indicative active of *empfehlen*, the imperfect subjunctive active of *tragen*, the present conditional active of *reiſsen*, the perfect indicative passive of *finden*.

9 Write the synopsis of *thun* in the third person singular of the indicative and subjunctive active.

10 Write, with article, the nominative and genitive singular and the nominative plural of the German words for *tree*, *man*, *boy*, *flower*, *garden*.

11 Decline, in the singular, *der schwarze Hund*, *ein schwarzer Hund*, *schwarzer Hund*.

12 Write the principal parts of *sprechen*, *aussehen*, *treffen*, *genieſsen*, *lassen*.

13 Translate into English: *a*) Es geht mir zu Herzen, *b*) Ich esse lieber weiſses Brot als schwarzes, *c*) Er kann nicht weiter, *d*) Sie warten nun schon drei Stunden, *e*) Es ist mir darum zu thun.

14 Translate into German: *a*) That may be too hard, *b*) He is proud of his new book, *c*) I can not help thinking of her, *d*) Do not go into the garden alone, *e*) Surely you are not afraid of the dog?

15 Write from memory and translate *one* of the following: *Vergiſsmeinnicht*, *Du bist wie eine Blume*, 10 consecutive lines of either *Sinnsprüche* or *Die Lorelei*.

High School Department

174TH EXAMINATION

GERMAN—First Year

Tuesday, June 17, 1902—9.15 a. m. to 12.15 p. m., **only**

Answer questions 7 and 8 and eight of the others but **no more.** *If more than eight of the others are answered only the first eight answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–2 Translate into English:

DES BLINDEN KINDES BILDERBUCH

Als der Knabe erwachte, bat er seine Mutter, sie möge ihn doch in den Himmel gehen lassen, damit er des Engels schöne Bilder alle sehen könne. Die Mutter weinte bitterlich und wollte ihn nicht von sich lassen, er bat aber so lange, bis sie es endlich erlaubte. Als es Nacht wurde, kam der Engel zum dritten Male und sah noch viel schöner und freundlicher aus als vorher. Er küſste den Kleinen auf beide Augen, indem er sprach: "Nun sieh dir dein Mütterchen an und nimm Abschied von ihr." Der blinde Knabe blickte um sich, erkannte seine Mutter, die er noch nie gesehen hatte und lächelte ihr freundlich zu.

erwachen=awake, *Abschied*=leave

3–4 Translate into English:

TAGEBUCH EINES ARMEN FRÄULEINS

Ich saſs mit der Tante am offenen Fenster, es war dämmerig, der Abendstern stand am lichten Himmel, der Mond stieg voll und golden über dem feinen Buchengezweig hinauf, der Kinder Lärmen tönte vom Dorf herüber, mir war zu Mut, ich weiſs nicht wie. Ich hatte nicht Ruhe in der Stube, ich hätte mögen in den Frühlingsabend hinaus, mit den Kindern lärmen, oder allein unter der Buche sitzen und nach dem Abendstern schauen. Die Tante war erst schweigsam. Du wirst wahrlich dem Trinchen ähnlich, sagte sie dann. Das freut mich! entgegnete ich.

Tagebuch=diary, *Buche*=beech-tree, *Trinchen*=Kitty

5–6 Translate into English:

WAS SICH DER WALD ERZÄHLT

Was wir dem Winter zu Leide gethan haben, daſs er uns armen Blumen so gar gram ist, das kann ich euch nicht sagen, und darüber sind die Meinungen sehr verschieden. Das nur steht fest, dafs er uns nicht leiden kann, und nicht eher ruht, als bis er uns alle von der Erde vertrieben hat. Aber sein Reich dauert ja auch nicht ewig, und nach ihm kommt unser bester Freund, der Frühling. Der sieht sich nun ganz betrübt um, wenn von allen den bunten Kindern, die er beim Scheiden dem Sommer empfohlen hat, keins mehr da ist, und mufs sein Haar in lange graue Schleier hüllen, weil er noch kein Blümchen oder Blatt hat, sich einen Kranz zu flechten.

gram=hostile, *Meinung*=opinion, *dauern*=last, *empfehlen*=recommend, *Schleier*=veil, *hüllen*=wrap

7 Translate into German:

a We shall wait till a quarter past ten.
b It may be found before they come.
c Please let me go with you.
d He has not yet begun to sing.
e Promise me to do as I say.

8 Conjugate, in the singular, the present indicative and the present subjunctive of *mögen*, the imperfect indicative of *fortgehen*, the present conditional active of *hoffen*, the pluperfect subjunctive of *leben*.

9 Write the synopsis of *brechen* in the third person singular of the indicative and subjunctive active.

10 Decline *unsre grofse Nation* in the singular, *dieser warme Tag* in the plural, *Herz* in both singular and plural.

11 State *two* ways in which adjectives may be compared and illustrate each. Write in the third person, singular and plural, the present indicative of *gelten* and of the modal auxiliary *wollen*.

12 Write the principal parts of *reden*, *laufen*, *stechen*, *spazieren*, *gelingen*.

13 Translate into German: (*a*) He is weak from hunger, (*b*) It happened a very long time ago, (*c*) I always get up early in the morning, (*d*) It would be worth the trouble, (*e*) He whom I command must obey.

14 Write and translate original German sentences of at least *six* words each, using correctly the following words: *hinein*, *herein*, *man*, *Mann*, *was für ein*.

15 Write from memory and translate 10 consecutive lines of *one* of the following: *Das Schlofs am Meere*, *Schwertlied*, *Heidenröslein*, *Der gute Kamerad*.

High School Department

171ST EXAMINATION

GERMAN—Second Year

Wednesday, September 25, 1901—9.15 a.m. to 12.15 p.m., only

Answer questions 7 and 8 and eight of the others but **no more.** *If more than eight of the others are answered only the first eight answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–2 Translate into English:

WAS DER HAUSSCHLÜSSEL ERZÄHLTE

"Ich habe nie einen hübscheren Jungen gekannt," begann der Erzähler, "als den, von dem ich jetzt berichten will. Alle Welt hatte ihn gern, und so auch ich, obwohl ich durch ihn mehrmals in eine recht bedenkliche Lage gekommen bin. Damals war er noch ein Knabe von etwa zehn Jahren und schaute mit einem Paar groſser brauner Augen schelmisch in die Welt hinein. Ich stand im Dienst seiner Eltern, war aber mit dem lustigen Willy noch nie in Berührung gekommen. Um so freudiger war ich überrascht, als mich der kleine Bursche eines Tages vom Nagel nahm, in seine Tasche steckte und in's Freie trug."—*Baumbach*

bedenklich=trying, *schelmisch*=roguishly, *Berührung*=contact

3–4 Translate into English:

HÖHER ALS DIE KIRCHE

Für ihn und Maili war keine Rettung, keine Hoffnung mehr! Immer sah er das todesbleiche, geliebte Mädchen vor sich, das er nicht mehr berühren durfte, und Schmerz, Verlangen und Wut erpreſsten dem sonst so starken Mann heiſse unaufhaltsame Thränen. Er begrub die schweiſsbedeckte Stirn in den Händen und schluchzte wieder wie vor Jahren hülflos wie ein Kind: "O mein Kaiser, mein Kaiser, warum bist du mir gestorben?" Aber diesmal war Maili nicht da, um ihm zu sagen, daſs Gott bei ihnen sei, und keine Künstlervision richtete ihn wie damals mit stolzen Hoffnungen auf.—*von Hillern*

berühren=touch, *Wut*=rage

5–6 Translate into English:

DIE VIERZEHN NOTHELFER

Ein andermal war Konrad den ganzen Tag im Wald umhergestrichen, meilenweit von der Stadt. Da sah er den Herrn von Haltenberg mit seinem Hund seitab in den Tannen. Er hätte sich unbemerkt davonschleichen können. Doch das fiel ihm gar nicht ein; höchst treuherzig trat er vor den Alten, grüfste ihn und sprach: "Ihr jagt auf Hirsche, und ich jage auf Verse; sie schwärmen mir wie Bienen im Kopf und wollen nur eingefangen sein; seit Sonnenaufgang irre ich von Hag zu Hag und mache die schönsten Gedichte. Nirgends dichtet sich's besser als im Wald!"—*Riehl*

treuherzig=confidently, *Hag*=meadow

7 Translate into German: *a*) I shall be at home before the sun sets, *b*) Tell me how it happened, *c*) I heard him singing as he went away, *d*) He wrote rapidly in order to lose no time, *e*) He will give you a book because you are good.

8 Conjugate, in the singular, the present indicative active of *wachsen*, the imperfect indicative of *bleiben*, the present subjunctive of *wandern*, the future indicative passive of *finden*, the imperfect subjunctive passive of *lieben*.

9 Write the principal parts of *schreiben*, *auslachen*, *heifsen*, *berichten*, *schelten*.

10 Write the synopsis of *loben* in the third person singular of the indicative and subjunctive, active and passive. Mention in each case the name of the tense.

11 Translate into English: *a*) Der Frühling war im Anzug, *b*) Man spricht stark davon, *c*) Er hat gut reden, *d*) Er bringt mich mit seinem Bruder in Bekanntschaft, *e*) Wie ist Ihnen zu Mute?

12 Mention *three* uses of the infinitive; *two* uses of the present tense. Write an original German sentence illustrating each.

13 Translate into German: *a*) Whenever I call her she runs away, *b*) He is not so old as you think, *c*) I don't know how he lives, *d*) Today is the twenty fifth of September, *e*) Is this the pencil that you want?

14 Write and translate original German sentences of at least *six* words each, containing *three* of the following: *a*) a reflexive verb, *b*) an indeclinable word, *c*) a cognate accusative, *d*) an adverbial genitive, *e*) a condition.

15 Write from memory and translate 10 consecutive lines of any German poem.

High School Department

172D EXAMINATION

GERMAN—Second Year

Monday, January 27, 1902—9.15 a. m. to 12.15 p. m., only

Answer questions 7 and 13 and eight of the others but **no more.** *If more than eight of the others are answered only the first eight answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1-2 Translate into English:

DAS KALTE HERZ

"Und hab' ich mein Herz verkauft," schrie Peter, "so ist niemand daran schuld, als du, und deine betrügerischen Schätze; du tückischer Geist hast mich in's Verderben geführt, mich getrieben, daſs ich bei einem Andern Hilfe suchte, und auf dir liegt die ganze Verantwortung." Aber kaum hatte er dies gesagt, so wuchs und schwoll das Glasmännlein und wurde hoch und breit, und seine Augen sollen so groſs gewesen sein, wie Suppenteller, und sein Mund war wie ein geheizter Backofen, und Flammen blitzten daraus hervor. Peter warf sich auf die Kniee, und sein steinernes Herz schützte ihn nicht, daſs nicht seine Glieder zitterten, wie eine Espe.—*Hauff*

betrügerisch=deceitful, *tückisch*=tricky, *Espe*=aspen

3-4 Translate into English:

ALLE FÜNF

Der Doktor war an das Fenster getreten und blickte hinaus in die stille Straſse, und die Doktorin strickte so eifrig an ihrem Strumpf, als müsse er heute noch fertig werden. Erst nachdem alles im Nebenzimmer still geworden, winkte der Doktor seiner Frau, mit ihm hineinzutreten. Eine rührende Gruppe bot sich ihnen dar. Die vier ältesten Kinder waren aus ihren zwei Betten in eins zusammengekrochen, und wie sie in ihrem Schmerz sich gegenseitig fest umklammert hatten, noch die Thränen auf den Wangen, so hatte der Schlaf sie überrascht. "Arme Kinder!" flüsterte der Doktor.—*Stökl*

5-6 Translate into English:

IMMENSEE

Drauſsen auf der Straſse war es tiefe Dämmerung; er fühlte die frische Winterluft an seiner heiſsen Stirn. Hie und da fiel der helle Schein eines brennenden Tannenbaums aus den Fenstern, dann und wann hörte man von drinnen das Geräusch von kleinen Pfeifen und Blechtrompeten und dazwischen ju-

belnde Kinderstimmen. Scharen von Bettelkindern gingen von Haus zu Haus, oder stiegen auf die Treppengeländer und suchten durch die Fenster einen Blick in die versagte Herrlichkeit zu gewinnen. Mitunter wurde auch eine Thür plötzlich aufgerissen, und scheltende Stimmen trieben einen ganzen Schwarm solcher kleinen Gäste aus dem hellen Hause auf die dunkle Gasse hinaus.—*Storm*

Blech=tin, *Schar*=troop

7 Translate into German: *a*) That is not to be thought of for a moment, *b*) Whoever you are, go away at once, *c*) You could never make me believe such a tale, *d*) The harder you work the more tired you become, *e*) Could I have done otherwise? Tell me that.

8 Write the second person, singular and plural, of *a*) the present indicative of *dürfen*, *b*) the present subjunctive of *dürfen*, *c*) the imperfect subjunctive of *fliegen*, *d*) the perfect indicative passive of *essen*, *e*) the perfect subjunctive passive of *essen*.

9 Write the principal parts of *bieten*, *empfehlen*, *mögen*, *sterben*, *schleichen*.

10 Write the synopsis of *können* in the third person singular.

11 Translate into English: *a*) Ich habe ihn seit langer Zeit in Verdacht, *b*) Der König lebt auf einem grofsen Fufse, *c*) Wir kennen sie nur von Ansehen, *d*) Die Sage liegt mir immer im Sinne, *e*) Immer schlägt er sich mit seinen eigenen Worten.

12 How is the future passive participle (gerundive) formed? Write and translate an original German sentence illustrating its use.

13 Translate into German: *a*) He came running to meet me, *b*) Not till night did he confess his fault, *c*) I shall be pleased to do it the day after tomorrow, *d*) He is said to be very faithful, *e*) Today you will not see them, but perhaps tomorrow you will.

14 Mention a simple verb. Give *two* compounds of this verb, showing in each case the force of the prefix. Write and translate original German sentences containing the *three* verbs mentioned.

15 Write from memory and translate 10 consecutive lines of *one* of the following: *Das Veilchen*, *Wunsch*, *Der Handschuh*, *Die Grenadiere*.

High School Department

174TH EXAMINATION

GERMAN—Second Year

Monday, June 16, 1902—9.15 a. m. to 12.15 p. m., only

Answer questions 7 and 8 and eight of the others but **no more.** *If more than eight of the others are answered only the first eight answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–2 Translate into English:

DER SPIEGEL DES CYPRIANUS

Nachdem der Spiegel aufgestellt war, und die Träger sich entfernt hatten, setzte die Alte sich wieder an die Seite des Bettes. "Ein Wunder muſs geschehen!" sprach sie vor sich hin. Dann saſs sie mit geschlossenen Augen wie ein steinern Bild; unsichtbar aber kämpften in ihr Furcht und Hoffnung. Sie harrte auf die Rückkunft der Gräfin; aber wie lang muſste sie noch warten, bis der Schlaf die ganz verwachte Frau verlassen haben würde.

Da that sich die Thür auf, und die Gräfin trat herein. "Es hat mich nicht schlafen lassen, Amme," sagte sie; "verzeih' es mir! Du bist so treu und gut, und verständiger wohl als ich."—*Storm*

verwachen=wear out

3–4 Translate into English:

BRIGITTA

Tags darauf war der Rittmeister anders geworden und ich auch.

Als ich beim Erwachen dran dachte, wen ich zu pflegen habe, meinte ich wieder, ich könne es nicht und dürfe es nicht; ich könnte auch keine treue Pflegerin eines Menschen sein, den ich in Grund und Boden hinein verfluche. Ich habe bisher meine Pflicht gethan, jetzt müſste ich ungetreu an meiner Pflicht werden. Das muſs ich dem Professor sagen. Und wieder dachte ich, was geht's dich an, wer der Kranke ist? Und er ist ja gestraft; man muſs doch Erbarmen mit ihm haben, und er ist ja doppelt elend, blind mit einem bösen Gewissen.

—*Auerbach*

5–6 Translate into English:

WILHELM TELL

Stauffacher—Jetzt gehe jeder seines Weges still
Zu seiner Freundschaft und Genoſssame.

Wer Hirt ist, wintre ruhig seine Herde
Und werb' im Stillen Freunde für den Bund.
—Was noch bis dahin muſs erduldet werden,
Erduldet's! Laſst die Rechnung der Tyrannen
Anwachsen, bis ein Tag die allgemeine
Und die besondere Schuld auf einmal zahlt.
Bezähme jeder die gerechte Wut,
Und spare für das Ganze seine Rache.—*Schiller*
bezähmen=restrain

7 Translate into German: (*a*) You may read those books if you can, (*b*) Do not rely on his promises, (*c*) You must wait if you wish to speak to him, (*d*) Though you do not believe me, I speak the truth, (*e*) To do my duty is my highest wish.

8 Translate into German: (*a*) At sunset we must be beyond the river, (*b*) In order to live right, we must think right, (*c*) I shall not answer this letter without telling you, (*d*) Ask him what he is afraid of, (*e*) Where were you when I took a walk?

9 Conjugate, in the singular, the present indicative of *wachsen*, the imperfect indicative active of *genieſsen*, the present subjunctive of *müssen*. Write the participles and the infinitives of *gehen*.

10 Write the synopsis of *anfangen* in the second person singular of the indicative and subjunctive active.

11 Give the principal parts of *begleiten*, *bitten*, *heiſsen*, *davonlaufen*, *sprieſsen*.

12 Translate into English: (*a*) Es ist um rasend zu werden, (*b*) Bei der Sache ist ein Aber, (*c*) Sie stehen im guten Andenken bei ihm, (*d*) Er macht viel Redens davon, (*e*) Ich kann nicht damit zurecht kommen.

13 Mention the word from which *each* of the following is derived and explain the derivation of each: *Bund*, *Gärtner*, *Antwort*, *Ursprache*, *Fremdling*.

14 Write and translate original German sentences of at least *six* words each, using correctly the following words: *derselbe*, *manch*, *genug*, *darauf*, *was*.

15 Write from memory and translate either *Wandrers Nachtlied* or the last 10 lines of *one* of the following: *Die Hoffnung*, *Die Riesen und die Zwerge*, *Die Wacht am Rhein*.

University of the State of New York

High School Department

172D EXAMINATION

GERMAN—Third Year

Monday, January 27, 1902—1.15 to 4.15 p. m., only

Answer questions 7 and 14 and eight of the others but **no more.** *If more than eight of the others are answered only the first eight answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–2 Translate into English:

IPHIGENIE AUF TAURIS

Pylades—O süſse Stimme! Vielwillkommner Ton
Der Muttersprach' in einem fremden Lande!
Des väterlichen Hafens blaue Berge
Seh' ich Gefangner neu willkommen wieder
Vor meinen Augen. Laſs dir diese Freude
Versichern, daſs auch ich ein Grieche bin!
Vergessen hab' ich einen Augenblick,
Wie sehr ich dein bedarf, und meinen Geist
Der herrlichen Erscheinung zugewendet.
O sage, wenn dir ein Verhängnis nicht
Die Lippe schlieſst, aus welchem unsrer Stämme
Du deine göttergleiche Herkunft zählst.—*Goethe*

3–4 Translate into English:

MARIA STUART

Maria—Ich bin die Schwache, sie die Mächt'ge.—Wohl,
Sie brauche die Gewalt, sie tödte mich,
Sie bringe ihrer Sicherheit das Opfer.
Doch sie gestehe dann, daſs sie die Macht
Allein, nicht die Gerechtigkeit geübt.
Nicht vom Gesetze borge sie das Schwert,
Sich der verhaſsten Feindin zu entladen,
Und kleide nicht in heiliges Gewand
Der rohen Stärke blutiges Erkühnen.
Solch Gaukelspiel betrüge nicht die Welt!—*Schiller*

Gaukelspiel=juggling

5–6 Translate into English:

MINNA VON BARNHELM

Werner—Es lernt sich wohl. Man kann heut zu Tage mit seinem Gelde nicht vorsichtig genug sein.—Darnach hatte ich noch was an Sie zu bestellen, Herr Major; von der Rittmeisterin Marloff; ich kam eben von ihr her. Ihr Mann ist Ihnen ja vierhundert Thaler schuldig geblieben; hier schickt sie Ihnen auf Abschlag hundert Ducaten. Das Uebrige will sie künftige Woche schicken. Ich möchte wohl selber Ursache sein, daſs

sie die Summe nicht ganz schickt. Denn sie war mir auch ein Thaler achtzig schuldig; und weil sie dachte, ich wäre gekommen, sie zu mahnen—wie's denn auch wohl wahr war—so gab sie mir sie, und gab sie mir aus dem Röllchen, das sie für Sie schon zurecht gelegt hatte.—*Lessing*

7 Translate into German: In the first years of his reign, King Alfred is said to have conducted himself haughtily toward his subordinates and to have dismissed their complaints roughly. St Neot, his kinsman, was deeply grieved over this and predicted future misfortune. But Alfred paid no heed till he was driven from his throne.

8 Translate into English: *a*) Er kennt sich nicht vor Wut, *b*) Morgen hoffe ich sie wird in sich gehen, *c*) Sie legten die Sache an den Tag, *d*) Das soll ihm teuer zu stehen kommen, *e*) Wir müssen sogleich vor die Hand nehmen, *f*) Ich gebe meinen Willen dazu, *g*) Der Name thut nichts zur Sache, *h*) Er war gerade bei Laune, *i*) Was schreiben wir heute? *j*) Warum steht er sich selbst im Lichte?

9 Write in German about 75 words on the life and works of Schiller *or* of Uhland.

10 Mention *three* uses of *es* and write and translate original German sentences illustrating these uses.

11 Write in German a letter of about 75 words to a friend, telling him how you spent your Christmas vacation.

12 Translate into German the following sentences illustrating the use of tenses in indirect discourse: *a*) He says that he will go, *b*) He believes that I am right, *c*) He said that he was ill, *d*) He said that he had been ill, *e*) He said that he would remain at home.

13 Distinguish in meaning *reden*, *sprechen* and *sagen; rennen* and *laufen*. Use each of these words in an original German sentence.

14 Translate into German: When some one, before the battle of Narva, told Charles 12 of Sweden that the numbers of the enemy were as three to one, he replied, "I am glad to hear it; then there will be enough of them to kill, enough to make prisoners and enough to put to flight."

15 Write from memory and translate 10 consecutive lines of *one* of the following: *Mein Vaterland*, *Des Sängers Fluch*, *Belsazar*, *Der Schnitter Tod*.

University of the State of New York

High School Department

174TH EXAMINATION

GERMAN—Third Year

Monday, June 16, 1902—1.15 to 4.15 p. m., only

Answer questions 7 and 8 and eight of the others but **no more.** *If more than eight of the others are answered only the first eight answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–2 Translate into English:

DER NEFFE ALS ONKEL

Champagne (allein)—Da bin ich nun allein!—Freund Champagne, du bist ein Dummkopf, wenn du deine Unbesonnenheit von vorhin nicht gut machst—Dem Onkel die ganze Karte zu verraten! Aber laſs sehen! Was ist da zu machen? Entweder den Onkel oder den Bräutigam müssen wir uns auf die nächsten zwei Tage vom Halse schaffen, sonst geht's nicht—Aber wie ist's da anzufangen?—Wart'—Laſs sehen—(Nachsinnend) Mein Herr und dieser Herr von Lormeuil sind zwar als ganz gute Freunde auseinandergegangen; aber es hätte doch Händel zwischen ihnen setzen können! Können, das ist mir genug!

—*Schiller*

3–4 Translate into English:

DANKSAGUNG

Allen Freunden, die an der durch den Herrn Professor mir überreichten Gabe sich beteiligt haben, sage ich, zugleich im Namen meiner Familie, unsern allerwärmsten Dank. Nicht nur die alle Erwartung übertreffende Höhe der Gabe, sondern auch die Beteiligung aus allen Kreisen des höheren Lehrerstandes, aus allen Staaten des Reiches, hat mich mit unaussprechlicher Freude, mit nie erlöschender Dankbarkeit erfüllt.

Danksagung=acknowledgment

5–6 Translate into English:

UHLAND

Zu Ende des Jahres 1812 wurde Uhland als Sekretär beim Justizministerium in Stuttgart angestellt und hat nun seinen Wohnsitz siebzehn Jahre lang in der Landeshauptstadt gehabt. In der amtlichen Thätigkeit blieb er freilich nur kurz. Sie war in keiner Weise erquicklich für ihn. Der Zwiespalt zwischen seinen Ansichten und dem bureaukratischen und autokratischen

Regiment, in dessen Dienst er stand, verbitterte ihm seine Thätigkeit. Es kam das Jahr 1813, in welchem Uhlands Landsleute gegen die deutschen Brüder im Feld standen; es kam aber auch der Anschlufs der Württemberger an die Verbündeten und ihr rühmlicher Anteil an dem Kampf unter dem Kronprinzen Wilhelm.—*Fischer*

7 Translate into German: Ludwig Uhland was born in Tübingen on April 26, 1787. His grandfather was a highly esteemed professor in the university which gives to the whole town its character. His father was not less closely connected with the same university. The gift of poetry was his inheritance from his mother.

8 Translate into German: King Henry the Fourth of France was preparing for war; no one knew against whom. Finally one of his courtiers said to him, "With whom are you going to fight?" "Can you be silent?" asked the king. "Assuredly, Your Majesty." "So can I," said the king, and left him standing.

9 Write and translate original German sentences containing *five* of the following idioms: *machen lassen*, *etwas dagegen haben*, *daran sein*, *anders werden*, *in Furcht setzen*, *in Erfüllung gehen*, *aus den Augen kommen*.

10 Write in German about 75 words on the life and works of Goethe *or* of Körner.

11 Distinguish in meaning the words in the following pairs and write and translate original German sentences, using correctly each word: *Arbeit*, *Werk; viele*, *manche; Wollen*, *Wille; leben*, *wohnen; schlafen*, *einschlafen.*

12 Write in German a letter of at least 60 words, accepting an invitation to visit a friend during the summer vacation.

13 Give *five* rules relating to word order in the sentence. Write original German sentences illustrating the rules mentioned.

14 Write and translate German sentences illustrating the following: (*a*) *two* ways of avoiding the passive voice, (*b*) *two* uses of the present tense, (*c*) the difference in meaning between the modal auxiliaries *dürfen* and *können*.

15 Write from memory and translate 10 consecutive lines of *one* of the following: *Gebet während der Schlacht*, *Reiters Morgengesang*, *Der Schnitter Tod*, *Gesang der Geister über den Wassern.*

High School Department

172D EXAMINATION

SPANISH — First Year

Tuesday, January 28, 1902 — 1.15 to 4.15 p. m., only

Answer questions 7 and 8 and eight of the others but **no more.** *If more than eight of the others are answered only the first eight answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–2 Translate into English:

VÍAS DE COMUNICACIÓN

En nada ha habido un cambio tan grande en los tiempos modernos como en las vías de comunicación. Hace pocos años la manera más cómoda de viajar por tierra era á caballo, en coche, en litera ó en silla de manos. Entonces se consideraba un buen día de camino lo que ahora se hace solamente en una hora, con todas las comodidades que ofrecen los ferrocarriles de hoy. Los palacios flotantes que llevan en estos tiempos miles de pasajeros, y que se llaman, unos vapores de río y otros trasatlánticos, no los imaginaron nuestros antepasados ni en sus más atrevidas concepciones.

silla de manos=sedan-chair, *antepasado*=ancestor

3–4 Translate into English:

MANILA

Donde se encuentra hoy la ciudad de Manila tenían los indígenas entonces una ciudad que denominaban Maynila, la cual era el principal puerto de todas aquellas islas. Allí estableció Legazpi la capital, construyó las murallas que rodean á la ciudad, y proclamó al rey de España soberano de todo el archipiélago. En junio de 1571 organizó el ayuntamiento de la ciudad y trabajó con ahinco á fin de formar un buen gobierno. Pero por desgracia murió el año siguiente, y ninguno de los gobernadores generales que le sucedieron, durante los siglos de la gobernación española, fué tan deseoso del bien del país.

indígena=native, *ayuntamiento* = government, *ahinco* = earnestness

5–6 Translate into English:

EL PLANETA MARTE

Ya tenemos sobre el cenit, á media noche, el famoso planeta de que se habla tanto estos días. Hoy viernes, veintidós de

febrero, á las doce en punto de la noche, todo el que mire al centro de la bóveda estrellada, un poquito al sur, verá destacarse un lucero notable de color rojizo. Es el planeta Marte, que se halla en oposición entre el sol y la tierra.

Este lucero rojo que, según los charlatanes astrológicos, preside el tiempo en el año actual, es el mismo en que un astrónomo americano ha creído ver señales luminosas, que se le antojaron avisos ó intentos de comunicaciones interplanetarias por los habitantes de dicho astro.

bóveda=vault, *destacarse*=stand out, *charlatán*=quack, *antojarse*=groundlessly consider

7 Translate into Spanish: *a*) As the hours passed the multitude kept arriving from every side, *b*) If he asks you again, give them to him, *c*) They will go with you when their work is done, *d*) You could hear our children and the dog, *e*) His house is near mine.

8 Conjugate *esperar* in the present subjunctive active, *haber* in the imperfect indicative active, *permitirse* in the present indicative. [Do not omit the pronouns.]

9 Write the feminine of *negro*, *alemán*, *feliz*, *fiel*, *mejor*, *francés*, *verde*, *feote*, *joven*, *común*.

10 Translate into English: *a*) Es de esperar que no vendrá, *b*) Mi ventana da al campo, *c*) Se hace noche, *d*) La madre se sienta á la mesa, *e*) Debe de ser triste, *f*) Tiene razón, *g*) Aquí hay, *h*) A vista de ojos, *i*) Mano á mano, *j*) La alta mar.

11 Write the second person plural of the simple (uncompounded) tenses of the indicative, subjunctive, conditional and imperative active of *temer*.

12 Translate into Spanish: *a*) The streets of the town were already deserted when twelve o'clock struck, *b*) At daybreak the battle was continued, *c*) Come, let us hasten to the park, *d*) They were in the shop talking over the news, *e*) Today it is not cloudy, but tomorrow it will rain.

13 Compare *grande*, *bajo*, *alto*, *malo*. Form an adverb from *nuevo*, *fácil*.

14 State, with illustrations, *three* rules for accenting words.

15 Write from memory and translate at least 10 consecutive lines of *one* of the following: *La ramilletera ciega*, *Crepúsculo*, *Las dos tumbas*, *¿Quién menoscaba mis bienes?*

High School Department

174TH EXAMINATION

SPANISH—First Year

Tuesday, June 17, 1902—1.15 to 4.15 p. m., only

Answer questions 7 and 8 and eight of the others but **no more.** *If more than eight of the others are answered only the first eight answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–2 Translate into English:

LA REVOLUCIÓN DE LA GRANJA

En la misma mañana llegó á Madrid una carta de Barrio Ayuso, en que, sin referir particularidad alguna del movimiento, decía: "Auxilio pronto, pronto, ó no sé lo que sucederá de sus majestades." Apremiado por la urgencia del peligro, se avistó al punto Istúriz con el capitán general Quesada, y juntos acordaron marchar con fuerzas respetables á la Granja, castigar á los autores de la rebelión, y trasladar las reinas á Madrid. Para sancionar esta resolución, fueron convocados el consejo de ministros y el de gobierno, el capitán general y el presidente del Estamento de Próceres, marqués de Miraflores.

apremiar=press, *avistarse*=have an interview, *Estamento de Próceres*=House of Peers

3–4 Translate into English:

EL TIGRE Y EL NIÑO

El tigre se había recostado entre los árboles y estaba jugueteando con el niñito. ¡Cuán triste se sentía la infeliz madre, y cómo les rogaba á los hombres que le salvarán á su hijito! Mas, ¿qué podían hacer el padre y los criados? En esto uno de los hombres apuntó al tigre con su fusil. El hombre disparó, y el tigre, dando un salto y dejando escapar un grito de sufrimiento, cayó muerto. Adelantáronse todos al instante y hallaron al niño no sólo sano y salvo, sino con una sonrisa en los labios como si no estuviera asustado.

criado=servant, *disparar*=fire, *asustar*=terrify

5–6 Translate into English:

AL ANOCHECER EN GRANADA

La luna empezaba á blanquear los árboles, deshaciéndose como una gasa de plata por las obscuridades de los bosques.

Los ruiseñores, huéspedes eternos de aquel paraíso, la saludaban con sus más amorosos cantos, mientras que el cuclillo, cantor del silencio, lanzaba ya su compasado gemido, que había de repetir toda la noche.—¡Era el anochecer! ¡Era la primavera! ¡Era en Granada! . . . ¡Los que no hayáis amado ó llorado en aquel edén y á semejante hora, vanamente querréis imaginaros todo el misterio, todo el encanto, toda la poesía que caben en el alma humana!

gasa=gauze, *ruiseñor*=nightingale, *cuclillo*=cuckoo

7 Translate into Spanish: (*a*) Do this for me if you can, (*b*) Joe is usually here, but today he is at home, (*c*) Many more came than he expected, (*d*) This house was abandoned a long time ago, (*e*) I shall tell everything in order that you may understand.

8 Conjugate, in the singular, *sonar* in the present indicative active, *ponerse* in the preterit (past definite or aorist) indicative, *decir* in the present subjunctive active, *saber* in the future indicative active.

9 Indicate the gender and the division into syllables of the following nouns: *pesadumbre*, *perro*, *acción*, *calle*. Explain the use of the dieresis in *antigüé*, of the accent mark in *día*.

10 Write the irregular comparative of *bueno*, *pequeño*, *malo*, *grande*; the superlative of the adverbs *mucho*, *mal*, *poco*, *bien*; the absolute superlative of *rico*, *simple*.

11 Translate into Spanish: (*a*) It is doubtful when he will return, (*b*) I mean that tall man, (*c*) They took first the arms and then the men, (*d*) After the work was finished, he sat down under a tree, (*e*) Are you acquainted with him?

12 Mention *three* cases in which the indefinite article is omitted in Spanish but not in English.

13 Write and translate original Spanish sentences illustrating the use of *jamás*, *sino*, *cómo*, *hasta que*, *de* meaning than.

14 Write the first person singular and the third person plural of (*a*) the present indicative active and the preterit (past definite or aorist) indicative active of *dar*, (*b*) the present subjunctive and the imperfect (conditional) subjunctive of *estar*, (*c*) the imperfect indicative of *ser*.

15 Write from memory and translate at least 10 consecutive lines of *one* of the following: *La ramilletera ciega*, *Crepúsculo*, *El asno y el caballo*, *Sacudí*.

High School Department

172D EXAMINATION

SPANISH—Second Year

Thursday, January 30, 1902—1.15 to 4.15 p. m., only

Answer questions 7 and 10 and eight of the others but **no more.** *If more than eight of the others are answered only the first eight answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–2 Translate into English:

EL PÁJARO VERDE

En la noche del séptimo iban ya las tres peregrinas á guarecerse en una caverna para reposar, cuando descubrieron al ermitaño mismo, orando en el fondo. Una lámpara iluminaba con luz incierta y melancólica aquel misterioso retiro. Las tres temblaron de ser maldecidas, y casi se arrepintieron de haber ido hasta allí. Pero el ermitaño, cuya barba era más blanca que la nieve y cuya piel estaba más arrugada que una pasa, echó sobre ellas una mirada penetrante con unos ojos, aunque hundidos, relucientes como dos ascuas, y dijo con voz entera, alegre y suave.—*Valera*

orar=pray, *pasa*=raisin, *ascua*=glowing coal

3–4 Translate into English:

MARIANELA

Y desapareció entre el ramaje. Florentina sintió el ruido de la hierba, atendiendo á él como atiende el cazador á los pasos de la pieza que se le escapa; después todo quedó en silencio, y no se oía sino el sordo monólogo de la naturaleza campestre en mitad del día, un rumor que parece el susurro de nuestras propias ideas al extenderse irradiando por lo que nos circunda. Florentina estaba absorta, paralizada, muda, afligidísima, como el que ve desvanecerse la más risueña ilusión de su vida. No sabía qué pensar de aquel suceso, ni su bondad inmensa, que incapacitaba frecuentemente su discernimiento, podía explicárselo.—*Pérez Galdós*

cazador=hunter

5–6 Translate into English:

EL NIÑO DE LA BOLA

Poquísimas personas encontraron en las calles Don Trinidad y Manuel al trasladarse de una casa á otra, y todas ellas se arrimaron á las paredes con no menos susto que respeto, para dejar pasar á aquellos dos maravillosos personajes de que tanto se estaba hablando en toda la ciudad.

No sucedió, empero, lo mismo cuando, llegados á la Plaza Mayor, tuvieron que cruzar por delante de la célebre botica. Hallábase ésta á medio cerrar, y en la media puerta que aun

dejaba paso á la luz de adentro veíase á Vitriolo, quien despedía á sus últimos tertulios, dándoles tal vez instrucciones para el día siguiente.—*Alarcón*

arrimar=draw near, *susto*=fear, *tertulio*=clubmate

7 Translate into Spanish: *a*) She directed me to do so on the following Monday, *b*) Your gun was left at home. Have you others with you? *c*) He says nothing to anybody, *d*) Were they contented, they would be happier, *e*) It is agreeable to live in the country, isn't it?

8 Conjugate, in the singular, *ir* in the present subjunctive, *saber* in the future indicative active, *lanzar* in the preterit (past definite or aorist) active, *vivir* in the imperfect indicative, *caer* in the present indicative.

9 Translate into English:

Empezó la contratación de la semana con alguna paralización y pesadez en las operaciones; pero luego mejoró algún tanto el aspecto del mercado, debido á la mejor fisonomía que ofrecían los del extranjero.

Resultado de esta mejor disposición de los hombres de negocios es el alza que ofrece el cuadro comparativo, observándose que se han repuesto los valores, siendo los más favorecidos los de Aduanas, y los que no han tenido alteración, los de Filipinas.

10 Translate into Spanish: *a*) He is falling asleep, *b*) I wish you good morning, *c*) That remains to be seen, *d*) Come along, *e*) You do not know him, *f*) She must succeed, *g*) The servant had just arrived, *h*) You can count on him, *i*) After resting he told this story, *j*) He went away in spite of my entreaties.

11 Distinguish in meaning *a*) *lengua* and *idioma*, *b*) *antes* and *delante*, *c*) *estar* and *ser*, *d*) *haber* and *tener*, *e*) *andar* and *ir*.

12 Form and translate Spanish words containing suffixes denoting *ungainliness*, *ridicule*, *smallness*, *blow of*, *one who*.

13 Translate into Spanish [Do not use figures]: Louis 14, Charles 2, March 10, one eleventh, two millions, a dozen, double.

14 Write the third person singular and the first person plural of the simple (uncompounded) tenses of the indicative and conditional active of *pedir*.

15 Write from memory and translate at least 10 consecutive lines of *one* of the following: *El Español*, *Firmeza*, *Imagen espantosa de la muerte*, *Hymne de Riego*.

University of the State of New York

High School Department

174TH EXAMINATION

SPANISH—Second Year

Thursday, June 19, 1902—1.15 to 4.15 p. m., only

Answer questions 7 and 8 and eight of the others but **no more.** *If more than eight of the others are answered only the first eight answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–2 Translate into English:

EL AMIGO MANSO

Ocurrida esta gran desgracia, viví algún tiempo en casas de huéspedes; pero me fué tan mal, que tomé una casita, en la cual viví seis años, hasta que, por causa de derribo, tuve que mudarme á la que ocupo aún. Una excelente mujer, asturiana, amiga de mi madre, de inmejorables condiciones y aptitudes, se me prestó á ser mi ama de llaves. Poco á poco su diligencia puso mi casa en un pie de comodidad, arreglo y limpieza que me hicieron sumamente agradable la vida de soltero, y esta es la hora en que no tengo un motivo de queja.—*Pérez Galdós*

derribo=demolition, *limpieza*=cleanliness

3–4 Translate into English:

EL COMENDADOR MENDOZA

El sol radiante, que brilla en el cielo y dora el aire diáfano, hace más espléndida la escena. Increíble multitud de pájaros la anima y alegra con sus trinos. En Andalucía, huyendo de la tierra de secano, buscando el agua y la sombra, se refugían las aves en estos oasis donde hay frescura. Tales eran los sitios por donde paseaba el comendador con las dos bonitas muchachas. Apenas salieron de la población, tomaron la senda que llaman del medio. Ellas cogían flores, se deleitaban oyendo cantar los colorines ó reían sin saber de qué.—*Valera*

diáfano=clear, *colorín*=linnet

5–6 Translate into English:

GIL BLAS

Montó en un caballo de mano, que uno de los montados tenía por la brida, y se puso á la frente de los demás. Aunque eran sólo cuatro contre nueve, se arrojaron á nosotros con un brío que aumentó mi temor. No por eso dejé de prevenirme para disparar mi carabina, aunque temblaban todos los miembros de mi cuerpo como si estuviera azogado; mas, por contar las cosas como pasaron, cuando llegó el caso de dispararla, cerré los ojos, y volví la cabeza á otra parte, de manera que aquel tiro nunca puede ser á cargo de mi conciencia.

—*Le Sage* (*Padre Isla's translation*)

brío=courage, *azogar*=be agitated, *tiro*=shot

7 Translate into Spanish: (*a*) The invalid asked her if she would return, (*b*) The affair is to be regulated in the most convenient way, (*c*) There he stands in the center of the room, (*d*) Keep near the right bank of the river, (*e*) When does it begin?

8 Translate into Spanish: (*a*) The window looks out on the road, (*b*) The sun was setting, (*c*) It is not worth more than twenty dollars, (*d*) The room will scarcely hold them all, (*e*) Let me see.

9 Conjugate, in the plural, the present indicative passive of ***traer***, the present subjunctive active of ***sentir***, the future conditional active of ***valer***, the preterit (past definite or aorist) indicative active of ***inducir***, the future subjunctive active of ***pagar***.

10 Write and translate Spanish sentences illustrating the following uses of the infinitive: (*a*) as subject of a verb, (*b*) as object of a verb, (*c*) as modifier of a noun, (*d*) as modifier of an adjective, (*e*) as the equivalent of a temporal clause.

11 Give the verb stem from which *each* of the following is formed in the active voice and show the process of formation: the imperative, the imperfect indicative, the future indicative, the present subjunctive, the future subjunctive.

12 Translate into English: (*a*) Se puso muy pálido, (*b*) Vuelvo á hablar, (*c*) Echó á reir, (*d*) Acaba de llegar, (*e*) Este color cae bien con este otro, (*f*) Hace frío, (*g*) Déjale que venga, (*h*) Guárdese V. de caer, (*i*) El dice que no sabe escribir, (*j*) Da un paseo.

13 Write the personal pronouns used as (*a*) subject of a finite verb, (*b*) object of a preposition. State in each case the person, number and gender.

14 Assume that you are a Mexican coffee grower and wish to dispose of 1960 bags of coffee. Write in Spanish a letter to a New York commission merchant, negotiating for the sale of this coffee.

15 Write from memory and translate at least 10 consecutive lines of *one* of the following: ***Firmeza***, ***Imagen espantosa de la muerte***, ***Hymne de Riego***, ***¡Qué hermoso es ver el día!***

University of the State of New York

High School Department

172D EXAMINATION

SPANISH—Third Year

Tuesday, January 28, 1902—1.15 to 4.15 p. m., only

Answer questions 7 and 10 and eight of the others but **no more.** *If more than eight of the others are answered only the first eight answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–2 Translate into English:

DON QUIJOTE

Avisó á su escudero Sancho del día y la hora que pensaba ponerse en camino, para que él se acomodase de lo que viese que más le era menester; sobre todo le encargó que llevase alforjas. El dijo que sí llevaría, y que asimismo pensaba llevar un asno que tenía muy bueno, porque él no estaba ducho á andar mucho á pie. En lo del asno reparó un poco Don Quijote, imaginando si se le acordaba si algún caballero andante había traído escudero caballero asnalmente; pero nunca le vino alguno á la memoria: mas con todo esto determinó que le llevase con presupuesto de acomodarle de más honrada caballería en habiendo ocasión para ello.—*Cervantes*

alforja=saddle-bag, *ducho*=accustomed, *caballero andante*= knight-errant

3–4 Translate into English:

ESTUDIOS CRÍTICOS

Dice el discreto y originalísimo Carlysle, que si le propusieran que su patria no hubiese nunca dominado la India oriental, ó no hubiese nunca tenido á Shakspere, elegiría sin vacilar lo primero: porque verdaderamente la posesión de la India y las ventajas todas que puede traer consigo, aunque no faltan economistas que las pongan en duda, habrá de perderlas al cabo Inglaterra; pero Shakspere durará siempre. Los hombres de su misma lengua y raza que en California y en Australia, y en más remotas y apartadas regiones, si es posible, le lean en lo futuro, se envanecerán por él de ser ingleses, ó de descender de ingleses; y rota la unión política, será Shakspere símbolo de unión más alta, y lazo de fraternidad entre estos pueblos.

envanecerse=be proud, *roto*=broken —*Valera*

5–6 Translate into English:

GRANADA

Comprendió de Don Juan el buen sentido
En la quietud de su nocturna vela,

Que había el moro rey, muy entendido,
Coronado sus torres y alminares
Por uno y otro atento centinela,
Y diestra y sabiamente repartido
Sus vigías y puestos militares:
Concluyendo por fin Don Juan de Vera
    De la ciudad entera
    La nocturna revista,
Diciéndose á sí mismo sin reparo
Cuánto iba á ser al Castellano caro
Lograr de aquella tierra la conquista.—*Zorrilla*

7 Translate into Spanish: The other noted poet and leader of romanticism in Spain was Espronceda. He is more impassioned than Zorrilla, and his verses, when love or ambition or pride move him, are written with his heart's blood. In this style of writing he is scarcely less great than Byron.

8 Conjugate, in the singular, the simple (uncompounded) tenses of the indicative and the imperative active of *ver*.

9 Distinguish in meaning *a*) *el cura* and *la cura*, *b*) *el capital* and *la capital*, *c*) *el corte* and *la corte*, *d*) *el guardia* and *la guardia*, *e*) *el ayuda* and *la ayuda*.

10 Write in Spanish a letter containing at least 60 words, telling an intimate friend of some trip that you have recently taken.

11 Scan the first *two* lines of 5–6, marking the division into syllables. Mention the name of this verse. Define *soneto*, *estancia*, *rima aguda*, *rima llana*, *verso de redondilla mayor*.

12 Write in Spanish about 75 words on the life and works of *one* of the following: Calderón, Campoamor, Pérez Galdós.

13 Translate into English: *a*) Eran de oír, *b*) Se puso á aullar, *c*) No cabe más, *d*) No pudo menos de exclamar, *e*) Más vale tarde que nunca, *f*) Se dió por vencido, *g*) Me ocurre una idea, *h*) Está de prisa, *i*) Entre luz y luz, *j*) Fuera de sí.

14 Write the first person singular of the preterit (past definite or aorist) active and the past participle of *each* of the following: *abrir*, *hacer*, *poner*, *decir*, *escribir*.

15 Write from memory and translate at least 10 consecutive lines of *one* of the following: *Alhambra*, *Cupido*, *El sueño*, *A la patria*.

High School Department

174TH EXAMINATION

SPANISH—Third Year

Tuesday, June 17, 1902—1.15 to 4.15 p. m., only

Answer questions 7 and 8 and eight of the others but **no more.** *If more than eight of the others are answered only the first eight answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–2 Translate into English:

DON QUIJOTE

A lo cual le respondió Don Quijote: has de saber, amigo Sancho Panza, que fué costumbre muy usada de los caballeros andantes antiguos hacer gobernadores á sus escuderos de las ínsulas ó reinos que ganaban, y yo tengo determinado de que por mí no falte tan agradecida usanza, antes pienso aventajarme en ella, porque ellos algunas veces, y quizá las más, esperaban á que sus escuderos fuesen viejos, y ya después de hartos de servir y de llevar malos días y peores noches, les daban algún título de conde, ó por lo mucho de marqués, de algún valle ó provincia de poco más ó menos.—*Cervantes*

3–4 Translate into English:

ESTUDIOS CRÍTICOS

La lengua y la literatura inglesas son mucho menos conocidas en España y en toda Europa que las de los franceses, nuestros vecinos. Entre España é Inglaterra hay cortísimo comercio de ideas. En aquella isla miran nuestro moderno desenvolvimiento intelectual con un profundo é injustísimo desdén, que en España les pagaríamos con usura, si por medio de las traducciones y de los encomios que hacen de los libros ingleses los críticos y literatos franceses no se hubieran popularizado entre nosotros algunos autores de primer orden. Walter Scott, Gibbon y el mismo lord Byron son tal vez los tres autores ingleses modernos que más se leen en España.—*Valera*

5–6 Translate into English:

RAIMUNDO LULIO

Salí. La noche trasparente, llena
De reposo, insultaba mi tormento
Y parecía escarnecer mi pena.

Templó mi fiebre abrasadora el viento
Bullicioso y sutil, y más tranquilo
Dijo en la soledad mi pensamiento:
¡Mundo engañoso, adiós! Rompióse el hilo
Que me ligaba á tí, y en su regazo
La religión me prestará un asilo.
Unió la muerte con estrecho lazo
Nuestras almas ¡oh Blanca de Castelo!
Mi senda es fatigosa; pero el plazo
Breve y seguro. ¡Espérame en el cielo!—*Núñez de Arce*

7 Translate into Spanish: It is said of Lope de Vega that he composed 1800 comedies and 400 autos, many of which cost him but a single day's labor; for he wrote verse and prose with the same ease, never having to make corrections and never hesitating in the midst of a passage.

8 Write in Spanish an abstract (about 60 words) of some story that you have read.

9 Write the third person singular of the simple (uncompounded) tenses of the subjunctive and conditional active of *sacar*, *elegir*.

10 Translate into English: (*a*) Hizo un gran papel en París, (*b*) Nada se me va en ello, (*c*) Como dijo el otro, (*d*) Que venga ó que no venga, (*e*) Siento no poder ir, (*f*) Donde hay gana, hay maña, (*g*) Amanecimos en Habana, (*h*) Con que vámonos, (*i*) Ella salía de sí, (*j*) Dije á mi capote.

11 Write in Spanish about 75 words on the life and works of *one* of the following: Cervantes, Espronceda, Bécquer.

12 Scan lines 8 and 9 of questions 5–6, marking the division into syllables. Mention the name of this verse. Define and illustrate *asonancia*, *verso suelto*. Define *verso quebrado*.

13 Mention the orthographic changes that take place in the inflection of verbs whose infinitive ends in *cer* (preceded by a vowel), *car*, *zar*, *ger*, *quir*. Illustrate in each case.

14 Write the regular and the irregular past participle of *afligir*, *despertar*, *incluir*, *romper*, *maldecir*.

15 Write from memory and translate the last 10 lines of *one* of the following: *A la esperanza*, *Los defensores de la patria*, *Cupido*, *El sueño*.

High School Department

172D EXAMINATION

GREEK—First Year

Thursday, January 30, 1902—9.15 a. m. to 12.15 p. m., only

Answer question 15 and nine of the others but **no more.** *If more than nine of the others are answered only the first nine answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Define and illustrate *each* of the following: penult, oxytone, ν movable, euphonic change. Mention the liquids.

2 Write, with article, the accusative, singular and plural, of δῶρον, γέρων, παῖς, πόλις, χώρα.

3 Decline, in singular and plural, ὁδός, θάλαττα, δύναμις, ἡγεμών, στρατιώτης.

4 Decline πολὺς σῖτος in the singular; τρεῖς ἡμέραι in the plural; αὕτη ἡ νύξ in both singular and plural.

5 Decline ἀληθής in singular and plural in all genders; οὐδείς in the singular in all genders; ὅς in the plural in all genders.

6 Conjugate εἰμί in the present optative; λύω in the aorist subjunctive middle; πράττω in the aorist indicative passive.

7 Write the first form of πέμπω in all modes of the present active system. Write all the active participles of λείπω.

8 Write the principal parts of ἀκούω, ὁράω, τρέπω, γίγνομαι, τυγχάνω.

9 Translate into Greek: *a)* He was sent by the general, *b)* He wrote a letter to Cyrus, *c)* The plain was full of horsemen, *d)* He came during the night, *e)* He said that he had seen the river.

10 Mention the class of pronouns to which *each* of the following belongs: ὅς, τίς, τις, ἐγώ, οὗτος. Distinguish in meaning ὁ αὐτὸς ἀνήρ and ὁ ἀνὴρ αὐτός. Compare καλός, μακρός, μέγας

11 Translate into English:

Ἐπεὶ δὲ καὶ οἱ ἄλλοι στρατιῶται συνῆλθον, ἀνέστη πρῶτον μὲν Χειρίσοφος ὁ Λακεδαιμόνιος καὶ ἔλεξεν ὧδε· Ὦ ἄνδρες στρατιῶται, χαλεπά ἐστι τὰ παρόντα, ὁπότε στρατηγῶν στερόμεθα καὶ λοχαγῶν καὶ στρατιωτῶν.

τὰ παρόντα = present circumstances, στέρομαι = lack

12 Give the syntax of Λακεδαιμόνιος, λοχαγῶν. From what verb is each of the following and where is the form found: συνῆλθον, ἀνέστη?

13 Translate into English:

a Τῇ ὑστεραίᾳ οἱ βάρβαροι ἀπῆλθον.

b Τὸ εὖρος τούτου τοῦ ποταμοῦ δύο πλέθρα ἐστί.

c Οὗτος εἷλεν τὰ πλοῖα ἵνα μὴ Κῦρος διαβαίη τὸν ποταμόν.

d Πορευομένων τῶν Ἑλλήνων οἱ πολέμιοι κατέκαυσαν τὰς κώμας.

14 Write Greek sentences illustrating *three* of the following: dative of means or instrument, partitive genitive, accusative of specification, clause of result, condition contrary to fact.

15 Translate into Greek: *a*) Let us take horses in order that we may go as quickly as possible, *b*) Because of these things, he became friendly to me, *c*) Let us fight bravely against the king.

University of the State of New York

High School Department

174TH EXAMINATION

GREEK—First Year

Thursday, June 19, 1902—9.15 a. m. to 12.15 p. m., only

Answer question 15 and nine of the others but **no more.** *If more than nine of the others are answered only the first nine answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 State the difference between an enclitic and a proclitic, illustrating each. Define and illustrate double consonant, iota subscript, recessive accent.

2 Decline, in singular and plural, ὁπλίτης, σῶμα, γέρων, πεδίον, μήτηρ.

3 Decline εὐδαίμων κώμη in the singular; πᾶσαι νῆες in the plural; ὁ χαρίεις παῖς in both singular and plural.

4 Decline πᾶς in the singular in all genders; μέγας in the masculine and feminine, singular and plural; λελυκώς in the plural in all genders.

5 Compare μέλας, σώφρων, ἐχθρός, πιστός. Form *two* different adverbs from ταχύς and give the rule for the formation of each.

6 Conjugate πάσχω in the second aorist indicative active, ἵημι in the present subjunctive middle. Write all the active participles of τρέπω, giving the name in each case.

7 Write the first form of πράττω in all modes (not including participle) of the first aorist active and middle.

8 Write the principal parts of τιμάω, εὑρίσκω, τίθημι, τρέφω, φεύγω.

9 Translate into Greek: (*a*) He is a better man than his brother, (*b*) The soldiers will follow the king, (*c*) Cross the river and guard the boats, (*d*) Let the army come for we are able to fight, (*e*) Who is the ruler of this province?

10 Translate into English:

Μετὰ ταῦτα ἀφικνοῦνται ἐπὶ τὸν Ζάβατον ποταμόν, τὸ εὖρος τεττάρων πλέθρων. Καὶ ἐνταῦθα ἔμειναν ἡμέρας τρεῖς· ἐν δὲ ταύταις ὑποψίαι μὲν ἦσαν, φανερὰ δὲ οὐδεμία ἐφαίνετο ἐπιβουλή.

Ζάβατος = Zabatus, ὑποψία = suspicion, ἐπιβουλή = plot

11 Give the reason for the case of εὖρος, ἡμέρας. State where each of the following forms is found: ἀφικνοῦνται, ἦσαν, ἐφαίνετο.

12 State *two* ways in which the future stem may be formed from the verb stem (theme); *two* ways in which the first aorist active stem may be formed from the verb stem (theme). Illustrate each.

13 Translate into English:

a Βασιλεὺς δὲ καὶ οἱ σὺν αὐτῷ ἔλαβον τὰς κώμας.
b Κῦρος ἤρετο τίς ὁ θόρυβος εἴη.
c Ἐκέλευσε τούτους θέσθαι τὰ ὅπλα περὶ τὴν αὑτοῦ σκηνήν.
d Ἐὰν δ' ἡμεῖς νικήσωμεν, ποιήσομεν ὑμᾶς φίλους ἡμῖν.

14 State, with reason, the case that should be used in translating into Greek each italicized word in the following:

a They left during the *night*.
b Let us ask him for *boats*.
c Many of the *men* were angry.
d On the following *day* they appeared.
e I am *much* taller than he.

15 Translate into Greek:

a You must go quickly in order to take provisions.
b The Greeks were so many that the barbarians fled.
c If he should appear, the enemy would not conquer.
d While the soldiers were leaving the mountains, the general remained in the village.

University of the State of New York

High School Department

172D EXAMINATION

XENOPHON'S ANABASIS

Tuesday, January 28, 1902 — 1.15 to 4.15 p. m., only

Answer the first six questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–5 Translate into English:

a CYRUS QUESTIONS ORONTES

Τί οὖν, ἔφη ὁ Κῦρος, ἀδικηθεὶς ὑπ' ἐμοῦ νῦν τὸ τρίτον ἐπιβουλεύων μοι φανερὸς γέγονας; Εἰπόντος δὲ τοῦ Ὀρόντου ὅτι οὐδὲν ἀδικηθείς, ἠρώτησεν ὁ Κῦρος αὐτόν· Ὁμολογεῖς οὖν περὶ ἐμὲ ἄδικος γεγενῆσθαι; Ἦ γὰρ ἀνάγκη, ἔφη ὁ Ὀρόντης. Ἐκ τούτου πάλιν ἠρώτησεν ὁ Κῦρος, Ἔτι οὖν ἂν γένοιο τῷ ἐμῷ ἀδελφῷ πολέμιος, ἐμοὶ δὲ καὶ φίλος καὶ πιστός; Ὁ δὲ ἀπεκρίνατο ὅτι οὐδ' εἰ γενοίμην, ὦ Κῦρε, σοί γ' ἂν ἔτι ποτὲ δόξαιμι. — 1, 6

b CLEARCHUS IS DECEIVED BY TISSAPHERNES

Ταῦτα εἰπὼν ἔδοξε τῷ Κλεάρχῳ ἀληθῆ λέγειν· καὶ εἶπεν· οὐκοῦν, ἔφη, οἵτινες, τοιούτων ἡμῖν εἰς φιλίαν ὑπαρχόντων, πειρῶνται διαβάλλοντες πολεμίους ποιῆσαι ἡμᾶς, ἄξιοί εἰσι τὰ ἔσχατα παθεῖν; Καὶ ἐγὼ μέν γε, ἔφη ὁ Τισσαφέρνης, εἰ βούλεσθέ μοι οἵ τε στρατηγοὶ καὶ οἱ λοχαγοὶ ἐν τῷ ἐμφανεῖ ἐλθεῖν, λέξω τοὺς πρὸς ἐμὲ λέγοντας ὡς σὺ ἐπιβουλεύεις ἐμοί τε καὶ τῇ σὺν ἐμοὶ στρατιᾷ. Ἐγὼ δ', ἔφη ὁ Κλέαρχος, ἄξω πάντας· καὶ σοὶ αὖ δηλώσω ὅθεν ἐγὼ περὶ σοῦ ἀκούω. — 2, 5

c PERFIDY OF THE PERSIANS

Ἐπὶ τούτῳ Κλεάνωρ Ὀρχομένιος ἀνέστη, καὶ ἔλεξεν ὧδε· Ἀλλ' ὁρᾶτε μέν, ὦ ἄνδρες, τὴν βασιλέως ἐπιορκίαν καὶ ἀσέβειαν· ὁρᾶτε δὲ τὴν Τισσαφέρνους ἀπιστίαν, ὅστις λέγων ὡς γείτων τε εἴη τῆς Ἑλλάδος καὶ περὶ πλείστου ἂν ποιήσαιτο σῶσαι ἡμᾶς, καὶ ἐπὶ τούτοις αὐτὸς ὀμόσας ἡμῖν, αὐτὸς δεξιὰς δούς, αὐτὸς ἐξαπατήσας συνέλαβε τοὺς στρατηγούς, καὶ οὐδὲ Δία Ξένιον ᾐδέσθη, ἀλλὰ Κλεάρχῳ καὶ ὁμοτράπεζος γενόμενος, αὐτοῖς τούτοις ἐξαπατήσας τοὺς ἄνδρας ἀπολώλεκεν. — 3, 2

6 Translate into Greek:

a When Orontes was asked whether he had ever been wronged by Cyrus, he replied, "No."

b If Tissaphernes had not deceived us, our generals and soldiers would not have perished.

c The Greeks considered it of the highest importance to reverence the gods.

7 Give the reason for the case of ἀδελφῷ (*a*, 5), ἡμῖν (*b*, 2), ἐμοί (*b*, 5), βασιλέως (*c*, 2), Ἑλλάδος (*c*, 3), τούτοις (*c*, 7); for the mode of γένοιο (*a*, 5), δόξαιμι (*a*, 6), βούλεσθέ (*b*, 4), εἴη (*c*, 3).

8 Give the syntax of ἐπιβουλεύων (*a*, 1), γεγενῆσθαι (*a*, 3), ὑπαρχόντων (*b*, 2), παθεῖν (*b*, 3), σῶσαι (*c*, 4). Classify the following participles: ἀδικηθεὶς (*a*, 1), διαβάλλοντες (*b*, 2), λέγων (*c*, 3). Compare ἀληθῆ (*b*, 1), πλείστου (*c*, 4).

9 From what verb is each of the following and where is the form found: γενοίμην (*a*, 6), ἐλθεῖν (*b*, 5), δούς (*c*, 5), ᾐδέσθη (*c*, 6), ἀπολώλεκεν (*c*, 7)?

10 Conjugate γέγονας (*a*, 2), ἀνέστη (*c*, 1) in the voice, mode and tense here found. Write the first form of each mode, including participle, of εἰσι (*b*, 3) in the voice and tense here found. Compare ἄξιοί (*b*, 3).

11 Write the principal parts of ἄξω (*b*, 6), λέγων (*c*, 3), ὀμόσας (*c*, 4). Decline τοιούτων (*b*, 2) in the singular in all genders, Δία (*c*, 6).

12 Explain the force of οὖν (*a*, 4), γε (*b*, 3), αὖ (*b*, 7). Give the correlative of ἐγὼ μέν (*b*, 3). State the force of αὐτοῖς (*c*, 6).

13 Explain the reference in τῷ ἐμῷ ἀδελφῷ (*a*, 5), δεξιὰς δούς (*c*, 5), Δία Ξένιον (*c*, 6). Give the syntax of στρατηγοὶ καὶ λοχαγοὶ (*b*, 4). Explain the difference in meaning between περί with the genitive and περί with the accusative, illustrating from the above passages.

14 Give the composition of *each* of the following words and the meaning of each part: ὁμολογεῖς (*a*, 3), λοχαγοὶ (*b*, 4), ὁμοτράπεζος (*c*, 6). Give the derivation of each of the following, stating meaning of suffix and of stem: πολέμιος (*a*, 5), φιλίαν (*b*, 2).

15 Translate into English [This must be taken by those who desire credit for the fourth book]:

XENOPHON VOLUNTEERS TO TAKE THE HIGHTS

Ἀλλὰ μέντοι, ἔφη ὁ Χειρίσοφος, κἀγὼ ὑμᾶς τοὺς Ἀθηναίους ἀκούω δεινοὺς εἶναι κλέπτειν τὰ δημόσια, καὶ μάλα ὄντος δεινοῦ τοῦ κινδύνου τῷ κλέπτοντι, καὶ τοὺς κρατίστους μέντοι μάλιστα, εἴπερ ὑμῖν οἱ κράτιστοι ἄρχειν ἀξιοῦνται· ὥστε ὥρα καὶ σοὶ ἐπιδείκνυσθαι τὴν παιδείαν. Ἐγὼ μὲν τοίνυν, ἔφη ὁ Ξενοφῶν, ἕτοιμός εἰμι τοὺς ὀπισθοφύλακας ἔχων, ἐπειδὰν δειπνήσωμεν, ἰέναι καταληψόμενος τὸ ὄρος. Ἔχω δὲ καὶ ἡγεμόνας· οἱ γὰρ γυμνῆτες τῶν ἐφεπομένων ἡμῖν κλωπῶν ἔλαβόν τινας ἐνεδρεύσαντες· καὶ τούτων πυνθάνομαι ὅτι οὐκ ἄβατόν ἐστι τὸ ὄρος, ἀλλὰ νέμεται καὶ αἰξὶ καὶ βουσίν.— 4, 6

University of the State of New York

High School Department

173D EXAMINATION

XENOPHON'S ANABASIS

Tuesday, March 25, 1902 — 9.15 a. m. to 12.15 p. m., only

Answer the first six questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–5 Translate into English:

a CLEARCHUS GIVES HIS OPINION

Ἐμοὶ οὖν δοκεῖ οὐχ ὥρα εἶναι ἡμῖν καθεύδειν, οὐδ᾽ ἀμελεῖν ἡμῶν αὐτῶν, ἀλλὰ βουλεύεσθαι ὅ τι χρὴ ποιεῖν ἐκ τούτων. Καὶ ἕως γε μένομεν αὐτοῦ, σκεπτέον μοι δοκεῖ εἶναι ὅπως ὡς ἀσφαλέστατα μένωμεν· εἴ τε ἤδη δοκεῖ ἀπιέναι, ὅπως ὡς ἀσφαλέστατα ἄπιμεν, καὶ ὅπως τὰ ἐπιτήδεια ἕξομεν· ἄνευ γὰρ τούτων οὔτε στρατηγοῦ οὔτε ἰδιώτου ὄφελος οὐδέν. Ὁ δ᾽ ἀνὴρ πολλοῦ μὲν ἄξιος φίλος ᾧ ἂν φίλος ᾖ· χαλεπώτατος δ᾽ ἐχθρὸς ᾧ ἂν πολέμιος ᾖ. — 1, 3

b CLEARCHUS PROFESSES FRIENDSHIP FOR TISSAPHERNES

Ὅσων δὲ δὴ καὶ οἵων ἂν ἐλπίδων ἐμαυτὸν στερήσαιμι, εἴ σέ τι κακὸν ἐπιχειρήσαιμι ποιεῖν, ταῦτα λέξω. Ἐγὼ γὰρ Κῦρον ἐπεθύμησά μοι φίλον γενέσθαι, νομίζων τῶν τότε ἱκανώτατον εἶναι εὖ ποιεῖν ὃν βούλοιτο. Σὲ δὲ νῦν ὁρῶ τήν τε Κύρου δύναμιν καὶ χώραν ἔχοντα καὶ τὴν σαυτοῦ ἀρχὴν σώζοντα, τὴν δὲ βασιλέως δύναμιν, ᾗ Κῦρος πολεμίᾳ ἐχρῆτο, σοὶ ταύτην ξύμμαχον οὖσαν. Τούτων δὲ τοιούτων ὄντων, τὶς οὕτω μαίνεται ὅστις οὐ βούλεται σοὶ φίλος εἶναι; Ἀλλὰ μήν, — ἐρῶ γὰρ καὶ ταῦτα, ἐξ ὧν ἔχω ἐλπίδας καὶ σὲ βουλήσεσθαι φίλον ἡμῖν εἶναι. — 2, 5

c AN OMEN FROM THE GODS

Τοῦτο δὲ λέγοντος αὐτοῦ πτάρνυταί τις· ἀκούσαντες δὲ οἱ στρατιῶται πάντες μιᾷ ὁρμῇ προσεκύνησαν τὸν θεόν· καὶ ὁ Ξενοφῶν εἶπε· Δοκεῖ μοι, ὦ ἄνδρες, ἐπεὶ περὶ σωτηρίας ἡμῶν λεγόντων οἰωνὸς τοῦ Διὸς τοῦ Σωτῆρος ἐφάνη, εὔξασθαι τῷ θεῷ τούτῳ θύσειν σωτήρια ὅπου ἂν πρῶτον εἰς φιλίαν χώραν ἀφικώμεθα· συνεπεύξασθαι δὲ καὶ τοῖς ἄλλοις θεοῖς θύσειν κατὰ δύναμιν. Καὶ ὅτῳ δοκεῖ ταῦτ᾽, ἔφη, ἀνατεινάτω τὴν χεῖρα. — 3, 2

6 Translate into Greek:

- *a* We must plan to remain here in order to have provisions.
- *b* Do not deprive me of the hope that you will become a friend to us.
- *c* The general did not say why he did not sacrifice to the gods.

7 Give the reason for the case of ἡμῖν (*a*, 1), ἡμῶν (*a*, 1), στρατηγοῦ (*a*, 5), μοι (*b*, 2), τῶν (*b*, 3), ᾗ (*b*, 5), ὁρμῇ (*c*, 2); for the mode of μένωμεν (*a*, 3), στερήσαιμι (*b*, 1), ἀφικώμεθα (*c*, 5).

8 Give the syntax of καθεύδειν (*a*, 1), ἀπιέναι (*a*, 4), γενέσθαι (*b*, 3), οὖσαν (*b*, 6), λεγόντων (*c*, 3). Classify the following participles: νομίζων (*b*, 3), ἀκούσαντες (*c*, 1). Decline ὅτῳ (*c*, 6) in the singular in all genders.

9 From what verb is each of the following and where is the form found: ἀμελεῖν (*a*, 1), ᾖ (*a*, 6), ἐχρῆτο (*b*, 5), ἐφάνη (*c*, 4), ἀνατεινάτω (*c*, 6)?

10 Conjugate ἄπιμεν (*a*, 4), ἐφάνη (*c*, 4) in the voice, mode and tense here found. Write the first form of each mode, including participle, of βούλοιτο (*b*, 3) in the voice and tense here found. Compare ἀσφαλέστατα (*a*, 3).

11 Write the principal parts of μένομεν (*a*, 2), ἕξομεν (*a*, 4), ὁρῶ (*b*, 4), σώζοντα (*b*, 5), δοκεῖ (*c*, 6).

12 Give the force of γε (*a*, 2), γὰρ (*b*, 2), καὶ (*c*, 5). State the correlative of μὲν (*a*, 6). Account for the accent of πτάρνυταί (*c*, 1).

13 Write in direct discourse τῶν τότε . . . βούλοιτο (*b*, 3). Distinguish in meaning ἐχθρὸς (*a*, 6) and πολέμιος (*a*, 7). Explain the reference in Διὸς τοῦ Σωτῆρος (*c*, 3).

14 Give the composition of *each* of the following words and the meaning of each part: στρατηγοῦ (*a*, 5), ξύμμαχον (*b*, 6), συνεπεύξασθαι (*c*, 5). Show how the meaning of *each* of the following is derived: ἐπιτήδεια (*a*, 4), οἰωνὸς (*c*, 3).

15 Translate into English [This must be taken by those who desire credit for the fourth book]:

XENOPHON AND THE VILLAGE CHIEF VISIT CHIRISOPHUS

Ἐπεὶ δ' ἦλθον πρὸς Χειρίσοφον, κατελάμβανον κἀκείνους σκηνοῦντας, ἐστεφανωμένους τοῦ ξηροῦ χιλοῦ στεφάνοις, καὶ διακονοῦντας Ἀρμενίους παῖδας σὺν ταῖς βαρβαρικαῖς στολαῖς· τοῖς δὲ παισὶν ἐδείκνυσαν, ὥσπερ ἐνεοῖς, ὅ τι δέοι ποιεῖν. Ἐπεὶ δ' ἀλλήλους ἐφιλοφρονήσαντο Χειρίσοφος καὶ Ξενοφῶν, κοινῇ δὴ ἀνηρώτων τὸν κωμάρχην διὰ τοῦ περσίζοντος ἑρμηνέως τίς εἴη ἡ χώρα. Ὁ δ' ἔλεγεν ὅτι Ἀρμενία. Καὶ πάλιν ἠρώτων τίνι οἱ ἵπποι τρέφονται. Ὁ δ' ἔλεγεν ὅτι βασιλεῖ δασμός· τὴν δὲ πλησίον χώραν ἔφη εἶναι Χάλυβας, καὶ τὴν ὁδὸν ἔφραζεν ᾗ εἴη.—4, 5

University of the State of New York

High School Department

174TH EXAMINATION

XENOPHON'S ANABASIS

Tuesday, June 17, 1902 — 1.15 to 4.15 p. m., only

Answer the first six questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–5 Translate into English:

a THE GREEKS DISTRUST CYRUS

Εἰ δέ τι καὶ τῷ ἡγεμόνι πιστεύσομεν ᾧ ἂν Κῦρος διδῷ, τί κωλύει καὶ τὰ ἄκρα ἡμῖν κελεύειν Κῦρον προκαταλαμβάνειν; Ἐγὼ μὲν γὰρ ὀκνοίην ἂν εἰς τὰ πλοῖα ἐμβαίνειν ἃ ἡμῖν δοίη, μὴ ἡμᾶς αὐταῖς ταῖς τριήρεσι καταδύσῃ· φοβοίμην δ' ἂν τῷ ἡγεμόνι ᾧ δοίη ἕπεσθαι, μὴ ἡμᾶς ἀγάγῃ ὅθεν οὐχ οἷόν τε ἔσται ἐξελθεῖν· βουλοίμην δ' ἄν, ἄκοντος ἀπιὼν Κύρου, λαθεῖν αὐτὸν ἀπελθών· ὃ οὐ δυνατόν ἐστιν. — 1, 3

b THE GREEKS CROSS THE TIGRIS

Μετὰ δὲ ταῦτα ἀνεπαύοντο· ἐπὶ μέντοι τὴν γέφυραν ὅμως φυλακὴν ἔπεμψαν· καὶ οὔτε ἐπέθετο οὐδεὶς οὐδαμόθεν οὔτε πρὸς τὴν γέφυραν οὐδεὶς ἦλθε τῶν πολεμίων, ὡς οἱ φυλάττοντες ἀπήγγελλον. Ἐπειδὴ δὲ ἕως ἐγένετο, διέβαινον τὴν γέφυραν ἐζευγμένην πλοίοις τριάκοντα καὶ ἑπτά, ὡς οἷόν τε μάλιστα πεφυλαγμένως· ἐξήγγελλον γάρ τινες τῶν παρὰ Τισσαφέρνους Ἑλλήνων, ὡς διαβαινόντων μέλλοιεν ἐπιθήσεσθαι· ἀλλὰ ταῦτα μὲν ψευδῆ ἦν. — 2, 4

c PLAN PROPOSED BY XENOPHON

Ἴσως οὖν ἀσφαλέστερον ἡμῖν πορεύεσθαι πλαίσιον ποιησαμένους τῶν ὅπλων, ἵνα τὰ σκευοφόρα καὶ ὁ πολὺς ὄχλος ἐν ἀσφαλεστέρῳ εἴη. Εἰ οὖν νῦν ἀποδειχθείη τίνα χρὴ ἡγεῖσθαι τοῦ πλαισίου καὶ τὰ πρόσθεν κοσμεῖν, καὶ τίνας ἐπὶ τῶν πλευρῶν ἑκατέρων εἶναι, τίνας δ' ὀπισθοφυλακεῖν, οὐκ ἄν, ὁπότε οἱ πολέμιοι ἔλθοιεν, βουλεύεσθαι ἡμᾶς δέοι, ἀλλὰ χρῴμεθ' ἂν εὐθὺς τοῖς τεταγμένοις. Εἰ μὲν οὖν ἄλλος τις βέλτιον ὁρᾷ, ἄλλως ἐχέτω· εἰ δὲ μή, Χειρίσοφος μὲν ἡγείσθω, ἐπειδὴ καὶ Λακεδαιμόνιός ἐστι. — 3, 2

6 Translate into Greek:

- ***a*** **Because the soldiers did not trust Cyrus, they did not wish him to give them guides.**
- ***b*** **See to it that the baggage animals are safe as you march along.**
- ***c*** **If we had not guarded the bridge, the enemy would have crossed it and attacked us.**

7 Give the reason for the case of ἡμῖν (*a*, 2), ἡγεμόνι (*a*, 4), πολεμίων (*b*, 3), πλοίοις (*b*, 4), πλαισίου (*c*, 3); for the mode of διδῷ (*a*, 1), ὀκνοίην (*a*, 2), καταδύσῃ (*a*, 4), μέλλοιεν (*b*, 6), ἔλθοιεν (*c*, 5).

8 Give the syntax of ἐμβαίνειν (*a*, 3), ἀπελθών (*a*, 6), διαβαινόντων (*b*, 6), βουλεύεσθαι (*c*, 5). Classify the participle ἀπιὼν (*a*, 5). Mention *two* other infinitive constructions that might be used with κωλύει (*a*, 1). Decline πολὺς (*c*, 2) in the singular in all genders.

9 From what verb is each of the following and where is the form found: ἀγάγῃ (*a*, 4), ἐπέθετο (*b*, 2), ἐζευγμένην (*b*, 4), χρῴμεθ' (*c*, 5), ἡγείσθω (*c*, 7)?

10 Conjugate δοίη (*a*, 3), ἐπέθετο (*b*, 2) in the voice, mode and tense here found. Write the first form of each mode, including participle, of ὁρᾷ (*c*, 6) in the voice and tense here found. Compare βέλτιον (*c*, 6).

11 Write the principal parts of λαθεῖν (*a*, 6), διέβαινον (*b*, 4), ἐπιθήσεσθαι (*b*, 6), τεταγμένοις (*c*, 6), ἐχέτω (*c*, 7).

12 Explain the force of the second καὶ in (*a*, 1), γάρ (*b*, 5), οὖν (*c*, 6). State the correlative of εἰ μὲν (*c*, 6). Give the force of the voice of ἀνεπαύοντο (*b*, 1).

13 Account for the position of ἄκρα (*a*, 2); for the accent of γάρ (*b*, 5). Distinguish between τι (*a*, 1) and τί (*a*, 1). State *two* ways of expressing purpose (not found on this paper) and illustrate each by an original Greek sentence.

14 Give the derivation of *each* of the following words, stating in each case the meaning of primary word and of prefix or suffix: ὅθεν (*a*, 5), ἄκοντος (*a*, 5), Λακεδαιμόνιός (*c*, 7). Show how the meaning of οἰόν τε (*b*, 5) is derived. Comment on the use of negatives in (*b*, 2).

15 Translate into English [This must be taken by those who desire credit for the fourth book]:

JOY OF THE GREEKS ON BEHOLDING THE SEA

Ἐπεὶ δὲ ἀφίκοντο πάντες ἐπὶ τὸ ἄκρον, ἐνταῦθα δὴ περιέβαλλον ἀλλήλους καὶ στρατηγοὺς καὶ λοχαγοὺς δακρύοντες. Καὶ ἐξαπίνης, ἅτου δὴ παρεγγυήσαντος, οἱ στρατιῶται φέρουσι λίθους καὶ ποιοῦσι κολωνὸν μέγαν. Ἐνταῦθα ἀνετίθεσαν δερμάτων πλῆθος ὠμοβοείων καὶ βακτηρίας καὶ τὰ αἰχμάλωτα γέῤῥα· καὶ ὁ ἡγεμὼν αὐτός τε κατέτεμνε τὰ γέῤῥα καὶ τοῖς ἄλλοις διεκελεύετο. Μετὰ ταῦτα τὸν ἡγεμόνα οἱ Ἕλληνες ἀποπέμπουσι δῶρα δόντες ἀπὸ κοινοῦ ἵππον καὶ φιάλην ἀργυρᾶν καὶ σκευὴν Περσικὴν καὶ δαρεικοὺς δέκα· ᾔτει δὲ μάλιστα τοὺς δακτυλίους, καὶ ἔλαβε πολλοὺς παρὰ τῶν στρατιωτῶν.—4, 7

University of the State of New York

High School Department

172D EXAMINATION

HOMER'S ILIAD

Thursday, January 30, 1902 — 1.15 to 4.15 p. m., only

Answer the first six questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–5 Translate into English:

a CHRYSEIS IS SENT AWAY

1 ὣς τώ γ' ἀντιβίοισι μαχησαμένω ἐπέεσσιν
2 ἀνστήτην, λῦσαν δ' ἀγορὴν παρὰ νηυσὶν 'Αχαιῶν.
3 Πηλεΐδης μὲν ἐπὶ κλισίας καὶ νῆας ἐΐσας
4 ἤιε σύν τε Μενοιτιάδῃ καὶ οἷς ἑτάροισιν·
5 'Ατρεΐδης δ' ἄρα νῆα θοὴν ἅλαδε προέρυσσεν,
6 ἐς δ' ἐρέτας ἔκρινεν ἐείκοσιν, ἐς δ' ἑκατόμβην
7 βῆσε θεῷ, ἀνὰ δὲ Χρυσηίδα καλλιπάρῃον
8 εἷσεν ἄγων· ἐν δ' ἀρχὸς ἔβη πολύμητις 'Οδυσσεύς.—1, 304–311

b THERSITES IS SILENCED AND RIDICULED

1 ὁ δ' ἄρ' ἕζετο τάρβησέν τε,
2 ἀλγήσας δ', ἀχρεῖον ἰδὼν ἀπομόρξατο δάκρυ,
3 οἱ δὲ καὶ ἀχνύμενοί περ ἐπ' αὐτῷ ἡδὺ γέλασσαν.
4 ὧδε δέ τις εἴπεσκεν ἰδὼν ἐς πλησίον ἄλλον.
5 "ὢ πόποι, ἦ δὴ μυρί' 'Οδυσσεὺς ἐσθλὰ ἔοργεν
6 βουλάς τ' ἐξάρχων ἀγαθὰς πόλεμόν τε κορύσσων·
7 νῦν δὲ τόδε μέγ' ἄριστον ἐν 'Αργείοισιν ἔρεξεν,
8 ὃς τὸν λωβητῆρα ἐπεσβόλον ἔσχ' ἀγοράων."— 2, 268–275

c MENELAUS ACCEPTS THE PROPOSAL OF PARIS

1 τοῖσι δὲ καὶ μετέειπε βοὴν ἀγαθὸς Μενέλαος
2 "κέκλυτε νῦν καὶ ἐμεῖο· μάλιστα γὰρ ἄλγος ἱκάνει
3 θυμὸν ἐμόν· φρονέω δὲ διακρινθήμεναι ἤδη
4 'Αργείους καὶ Τρῶας, ἐπεὶ κακὰ πολλὰ πέποσθε
5 εἵνεκ' ἐμῆς ἔριδος καὶ 'Αλεξάνδρου ἕνεκ' ἀρχῆς.
6 ἡμέων δ' ὁπποτέρῳ θάνατος καὶ μοῖρα τέτυκται,
7 τεθναίη· ἄλλοι δὲ διακρινθεῖτε τάχιστα.
8 οἴσετε δ' ἄρν', ἕτερον λευκὸν ἑτέρην δὲ μέλαιναν,
9 γῇ τε καὶ ἠελίῳ· Διὶ δ' ἡμεῖς οἴσομεν ἄλλον."— 3, 96–104

6 Translate into Greek [Do not use rare or poetic constructions]:

a Do not hinder me from doing what I have promised.

b The horsemen marched so rapidly that we were unable to pursue them.

c Whoever fights bravely against the enemy will receive money and ships from the king.

7 Write the Attic prose form for ἐπέεσσιν (*a*, 1), νηυσὶν (*a*, 2), ἤιε (*a*, 4), οἷς (*a*, 4), γέλασσαν (*b*, 3), Ἀργείοισιν (*b*, 7), ἀγοράων (*b*, 8), ἐμεῖο (*c*, 2), διακρινθήμεναι (*c*, 3), ἠελίῳ (*c*, 9).

8 State the circumstances that led to the rebuke of Thersites (*b*). Give an account of the immediate results of the acceptance of the proposal in (*c*).

9 Give the reason for the case of ἐπέεσσιν (*a*, 1), Ἀχαιῶν (*a*, 2), θεῷ (*a*, 7), ἄριστον (*b*, 7), ἀγοράων (*b*, 8), βοὴν (*c*, 1), ἐμεῖο (*c*, 2), ἡμέων (*c*, 6); for the mode of διακρινθήμεναι (*c*, 3), τεθναίη (*c*, 7).

10 Classify the following participles: ἄγων (*a*, 8), ἀλγήσας (*b*, 2), ἀχνύμενοί (*b*, 3). Conjugate ἔκρινεν (*a*, 6), τεθναίη (*c*, 7) in the voice, mode and tense here found. Compare ἡδὺ (*b*, 3).

11 From what verb is each of the following and where is the form found: μαχησαμένω (*a*, 1), εἶσεν (*a*, 8), ἔρεξεν (*b*, 7), τέτυκται (*c*, 6), διακρινθεῖτε (*c*, 7)?

12 Write the principal parts of ἀνστήτην (*a*, 2), ἔσχ' (*b*, 8), οἴσομεν (*c*, 9). Decline Χρυσηΐδα (*a*, 7), ἄλγος (*c*, 2) in singular and plural. Compare μέλαιναν (*c*, 8).

13 Explain the force of ἄρα (*a*, 5), καὶ (*b*, 3), ἤδη (*c*, 3). Select from the above passages an iterative verb and a patronymic and explain the formation of each.

14 Give the composition of each of the following words and the meaning of each part: καλλιπάρῃον (*a*, 7), ἐπεσβόλον (*b*, 8), Ἀλεξάνδρου (*c*, 5). Mention and define the rhetorical figure in ἕτερον λευκὸν . . . καὶ ἠελίῳ (*c*, 8–9) and explain the reference.

15 Scan lines 5, 6 and 7 of (*c*), marking quantity of syllables, division into feet and principal cesuras. Account for the length of αι in καὶ (*c*, 5); of the ultima in Ἀλεξάνδρου (*c*, 5). Mention and explain the figure of prosody in ἡμέων (*c*, 6).

University of the State of New York

High School Department

174TH EXAMINATION

HOMER'S ILIAD

Thursday, June 19, 1902 — 1.15 to 4.15 p. m., only

Answer the first six questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–5 Translate into English:

a AGAMEMNON REFUSES TO GIVE UP HIS PRIZE

1 ἔνθ' ἄλλοι μὲν πάντες ἐπευφήμησαν Ἀχαιοί
2 αἰδεῖσθαί θ' ἱερῆα καὶ ἀγλαὰ δέχθαι ἄποινα·
3 ἀλλ' οὐκ Ἀτρεΐδῃ Ἀγαμέμνονι ἥνδανε θυμῷ,
4 ἀλλὰ κακῶς ἀφίει, κρατερὸν δ' ἐπὶ μῦθον ἔτελλεν.
5 "μή σε, γέρον, κοίλῃσιν ἐγὼ παρὰ νηυσὶ κιχείω
6 ἢ νῦν δηθύνοντ' ἢ ὕστερον αὖτις ἰόντα,
7 μη νυ τοι οὐ χραίσμῃ σκῆπτρον καὶ στέμμα θεοῖο.
8 τὴν δ' ἐγὼ οὐ λύσω."—1, 22–29

b ODYSSEUS OBEYS THE COMMAND OF ATHENA

1 ὣς φάθ', ὁ δὲ ξυνέηκε θεᾶς ὄπα φωνησάσης,
2 βῆ δὲ θέειν, ἀπὸ δὲ χλαῖναν βάλε· τὴν δ' ἐκόμισσεν
3 κῆρυξ Εὐρυβάτης Ἰθακήσιος, ὅς οἱ ὀπήδει.
4 αὐτὸς δ' Ἀτρεΐδεω Ἀγαμέμνονος ἀντίος ἐλθὼν
5 δέξατό οἱ σκῆπτρον, πατρώιον, ἄφθιτον αἰεί·
6 σὺν τῷ ἔβη κατὰ νῆας Ἀχαιῶν χαλκοχιτώνων.
7 ὅν τινα μὲν βασιλῆα καὶ ἔξοχον ἄνδρα κιχείη,
8 τὸν δ' ἀγανοῖς ἐπέεσσιν ἐρητύσασκε παραστάς. — 2, 182–189

c ALEXANDER REPLIES TO HECTOR'S REBUKE

1 τὸν δ' αὖτε προσέειπεν Ἀλέξανδρος θεοειδής·
2 "Ἕκτορ, ἐπεί με κατ' αἶσαν ἐνείκεσας οὐδ' ὑπὲρ αἶσαν —
3 αἰεί σοι κραδίη πέλεκυς ὥς ἐστιν ἀτειρής,
4 ὅς τ' εἶσιν διὰ δουρὸς ὑπ' ἀνέρος, ὅς ῥά τε τέχνῃ
5 νήιον ἐκτάμνῃσιν, ὀφέλλει δ' ἀνδρὸς ἐρωήν·
6 ὣς σοὶ ἐνὶ στήθεσσιν ἀτάρβητος νόος ἐστίν —
7 μή μοι δῶρ' ἐρατὰ πρόφερε χρυσέης Ἀφροδίτης·
8 οὔ τοι ἀπόβλητ' ἐστὶ θεῶν ἐρικυδέα δῶρα,
9 ὅσσα κεν αὐτοὶ δῶσιν. ἑκὼν δ' οὐκ ἄν τις ἕλοιτο. — 3, 58–66

6 Translate into Greek [Do not use rare or poetic constructions]:

a He said that he would go at once if they would give him boats and a guide.

b The bridge must be cut down in order that the enemy may not cross.

c We heard that they were fighting against the king's will.

7 Select 10 different epic forms from questions 1–5 and write the Attic prose form for each.

8 State the cause and the immediate results of the action of Odysseus in (*b*). Give the circumstances leading to Alexander's answer in (*c*).

9 Give the reason for the case of θυμῷ (*a*, 3), θεοῖο (*a*, 7), οἱ (*b*, 3), Ἀγαμέμνονος (*b*, 4), οἱ (*b*, 5), τέχνῃ (*c*, 4), μοι (*c*, 7), ἀπόβλητ' (*c*, 8); for the mode of αἰδεῖσθαί (*a*, 2), θέειν (*b*, 2).

10 Give the reason for the mode of κιχείω (*a*, 5), χραίσμῃ (*a*, 7), κιχείη (*b*, 7), δῶσιν (*c*, 9), ἕλοιτο (*c*, 9). Conjugate ἔρδῃ (*b*, 6) in the voice, mode and tense here found. Compare κακῶς (*a*, 4), ἀγανοῖς (*b*, 8).

11 From what verb is each of the following and where is the form found: ἥνδανε (*a*, 3), ξυνέηκε (*b*, 1), παραστάς (*b*, 8), ἐνείκεσας (*c*, 2), εἶσιν (*c*, 4)?

12 Write the principal parts of ἀφίει (*a*, 4), δέξατό (*b*, 5), πρόφερε (*c*, 7). State the force of the position of τὴν (*a*, 8). Explain in full the accent of ὣς (*b*, 1), ὥς (*c*, 3).

13 Explain the reference in σκῆπτρον καὶ στέμμα θεοῖο (*a*, 7), σκῆπτρον (*b*, 5); the formation of ἐρητύσασκε (*b*, 8). Mention *two* epithets other than χαλκοχιτώνων (*b*, 6) applied to the Achaeans. Mention and define a rhetorical figure in (*c*).

14 Give the composition of *each* of the following words and the meaning of each part: ἐπευφήμησαν (*a*, 1), χαλκοχιτώνων (*b*, 6), θεοειδής (*c*, 1). Explain the derivation of *each* of the following, giving meaning of stem and of prefix or suffix: πατρώιον (*b*, 5), ἐρικυδέα (*c*, 8).

15 Scan the first *three* lines of (*a*), marking quantity of syllables, division into feet and principal cesuras. Define asyndeton and tmesis, selecting an example of each from questions 1–5.

University of the State of New York

High School Department

172D EXAMINATION

GREEK—Second Year

Tuesday, January 28, 1902—1.15 to 4.15 p. m., only

Answer the first six questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–5 Translate into English:

a HOW AGESILAUS PROVIDED HIMSELF WITH CAVALRY

Ἐπεὶ μέντοι ἀνὰ τὰ πεδία οὐδὲ ἐν τῇ Φρυγίᾳ ἐδύνατο στρατεύεσθαι διὰ τὴν Φαρναβάζου ἱππείαν, ἔδοξεν αὐτῷ ἱππικὸν κατασκευαστέον εἶναι, ὡς μὴ δραπετεύοντα πολεμεῖν δέοι αὐτόν. Τοὺς μὲν οὖν πλουσιωτάτους ἐκ πασῶν τῶν ἐκεῖ πόλεων ἱπποτροφεῖν κατέλεξε. Προεῖπε δέ, ὅστις παρέχοιτο ἵππον καὶ ὅπλα καὶ ἄνδρα δόκιμον, ὡς ἐξέσοιτο αὐτῷ μὴ στρατεύεσθαι· καὶ ἐποίησεν οὕτως ἕκαστον προθύμως ταῦτα πράττειν ὥσπερ ἄν τις τὸν ὑπὲρ αὐτοῦ ἀποθανούμενον προθύμως μαστεύοι. Ἔταξε δὲ καὶ πόλεις ἐξ ὧν δέοι τοὺς ἱππέας παρασκευάζειν.—Xenophon, Agesilaus, 1

b LYSANDER OBTAINS MONEY FROM CYRUS

Τῷ δ' ἐπιόντι ἔτει, Λύσανδρος ἀφικόμενος εἰς Ἔφεσον μετεπέμψατο Ἐτεόνικον ἐκ Χίου σὺν ταῖς ναυσί, καὶ τὰς ἄλλας πάσας συνήθροισεν, εἴ πού τις ἦν, καὶ ταύτας τ' ἐπεσκεύαζε καὶ ἄλλας ἐν Ἀντάνδρῳ ἐναυπηγεῖτο. Ἐλθὼν δὲ παρὰ Κῦρον χρήματα ᾔτει· ὁ δ' αὐτῷ εἶπεν ὅτι τὰ μὲν παρὰ βασιλέως ἀνηλωμένα εἴη, καὶ ἔτι πλείω πολλῷ, δεικνύων ὅσα ἕκαστος τῶν ναυάρχων ἔχοι, ὅμως δ' ἔδωκε. Λαβὼν δὲ ὁ Λύσανδρος τἀργύριον, ἐπὶ τὰς τριήρεις τριηράρχους ἐπέστησε καὶ τοῖς ναύταις τὸν ὀφειλόμενον μισθὸν ἀπέδωκε.—Hellenica, 2, 1

c THE GIFTS OF FORTUNE

Καὶ γὰρ ἐκεῖνοι, ὅταν μὲν λάβωσι τὸ ἀργύριον παρὰ τῶν ἀνθρώπων χαίρουσι, καὶ ἴδιον νομίζουσιν εἶναι. Ὅταν δὲ ἀπαιτῶνται, ἀγανακτοῦσι, καὶ δεινὰ οἴονται πεπονθέναι· οὐ μνημονεύοντες, ὅτι ἐπὶ τούτῳ ἔλαβον τὰ θέματα, ἐφ' ᾧ μηδὲν κωλύειν τὸν θέμενον πάλιν κομίσασθαι. Ὡσαύτως τοίνυν κελεύει ἔχειν τὸ Δαιμόνιον καὶ πρὸς τὴν παρ' αὐτῆς δόσιν, καὶ μνημονεύειν, ὅτι τοιαύτην ἔχει φύσιν ἡ Τύχη, ὥστε ἃ δέδωκεν ἀφελέσθαι, καὶ ταχέως πάλιν δοῦναι πολλαπλάσια, αὖθις δὲ ἀφελέσθαι ἃ δέδωκεν.

—Cebes, Tabula, 31

6 Translate into Greek:

a Because he had no money to build ships Lysander went to Cyrus.

b Men ask why the gifts of fortune are taken away from them.

c He will not march till he has given the sailors the pay that is due them.

7 Explain how Agesilaus happened to be in Phrygia (*a*). Give an account of the condition of the Spartan fleet when Lysander went to Cyrus (*b*).

8 Give the reason for the case of ἱππικὸν (*a*, 2), ἔτει (*b*, :), πολλῷ (*b*, 5), ναυάρχων (*b*, 6), ἴδιον (*c*, 2); for the mode of δέοι (*a*, 3), παρέχοιτο (*a*, 4), μαστεύοι (*a*, 7), ἔχοι (*b*, 6), λάβωσι (*c*, 1).

9 Classify the following participles: ἀφικόμενος (*b*, 1), μνημονεύοντες (*c*, 3). Give the syntax of στρατεύεσθαι (*a*, 1), δραπετεύοντα (*a*, 3), πολεμεῖν (*a*, 3), ἱπποτροφεῖν (*a*, 4), εἶναι (*c*, 2), δοῦναι (*c*, 7). Decline τριήρεις (*b*, 7) in singular and plural.

10 From what verb is each of the following and where is the form found: ἔταξε (*a*, 7), συνήθροισεν (*b*, 2), ἀνηλωμένα εἴη (*b*, 5), πεπονθέναι (*c*, 3), ἀφελέσθαι (*c*, 7)?

11 Write the principal parts of ἐδύνατο (*a*, 1), κατέλεξε (*a*, 4), ἐπέστησε (*b*, 7), ὀφειλόμενον (*b*, 7), ἔχειν (*c*, 5).

12 Conjugate ἐδύνατο (*a*, 1), εἶπεν (*b*, 4) in the voice, mode and tense here found. Write the first form of each mode, including participle, of κελεύει (*c*, 5). Compare ταχέως (*c*, 7).

13 Give the force of οὖν (*a*, 3), the first καὶ in (*c*, 5). Explain the force of the imperfect in ᾔτει (*b*, 4); the contraction in τἀργύριον (*b*, 6); the force of ἀπό in ἀπέδωκε (*b*, 8).

14 Translate into Greek: If Agesilaus had not needed cavalry, he would not have asked the cities to provide him with men, arms and horses. But he thought that he must have cavalry in order to fight the horsemen of the enemy in the plains of Phrygia.

15 Give the composition of each of the following and the meaning of each part: ἱπποτροφεῖν (*a*, 4), τριηράρχους (*b*, 7), μηδὲν (*c*, 4). Explain the formation of the verbal adjective κατασκευαστέον (*a*, 2). Account for the use of μὴ (*a*, 5).

University of the State of New York

High School Department

174TH EXAMINATION

GREEK — Second Year

Tuesday, June 17, 1902 — 1.15 to 4.15 p. m., only

Answer the first six questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–5 Translate into English:

a NOBLE DESCENT OF AGESILAUS

Οἶδα μὲν ὅτι τῆς Ἀγησιλάου ἀρετῆς τε καὶ δόξης οὐ ῥᾴδιον ἄξιον ἔπαινον γράψαι, ὅμως δ' ἐγχειρητέον. Οὐ γὰρ ἂν καλῶς ἔχοι εἰ, ὅτι τελέως ἀνὴρ ἀγαθὸς ἐγένετο, διὰ τοῦτο οὐδὲ μειόνων ἂν τυγχάνοι ἐπαίνων. Περὶ μὲν οὖν εὐγενείας αὐτοῦ τί ἂν τις μεῖζον καὶ κάλλιον εἰπεῖν ἔχοι ἢ ὅτι ἔτι καὶ νῦν τοῖς προγόνοις ὀνομαζομένοις ἀπομνημονεύεται ὁπόστος ἀφ' Ἡρακλέους ἐγένετο, καὶ τούτοις οὐκ ἰδιώταις ἀλλ' ἐκ βασιλέων βασιλεῦσιν; Ἀλλὰ μὴν οὐδὲ ταύτῃ γ' ἂν τις ἔχοι καταμέμψασθαι αὐτοὺς ὡς βασιλεύουσι μέν, πόλεως δὲ τῆς ἐπιτυχούσης. — Xenophon, Agesilaus, 1

b CALLICRATIDAS TRIES TO SURPRISE THE ATHENIANS

Ὁ δὲ Καλλικρατίδας ἀκούων τὴν βοήθειαν ἤδη ἐν Σάμῳ οὖσαν, αὐτοῦ μὲν κατέλιπε πεντήκοντα ναῦς καὶ ἄρχοντα Ἐτεόνικον, ταῖς δὲ εἴκοσι καὶ ἑκατὸν ἀναχθεὶς ἐδειπνοποιεῖτο τῆς Λέσβου ἐπὶ τῇ Μαλέᾳ ἄκρᾳ ἀντίον τῆς Μυτιλήνης. Τῇ δ' αὐτῇ ἡμέρᾳ ἔτυχον καὶ οἱ Ἀθηναῖοι δειπνοποιούμενοι ἐν ταῖς Ἀργινούσαις· αὗται δ' εἰσὶν ἀντίον τῆς Λέσβου. Τῆς δὲ νυκτὸς ἰδὼν τὰ πυρά, καί τινων αὐτῷ ἐξαγγειλάντων ὅτι οἱ Ἀθηναῖοι εἶεν, ἀνήγετο περὶ μέσας νύκτας, ὡς ἐξαπιναίως προσπέσοι· ὕδωρ δ' ἐπιγενόμενον πολὺ καὶ βρονταὶ διεκώλυσαν τὴν ἀναγωγήν. Ἐπεὶ δὲ ἀνέσχεν, ἅμα τῇ ἡμέρᾳ ἔπλει ἐπὶ τὰς Ἀργινούσας. — Hellenica, 1, 6

c VICTIMS OF FALSE DISCIPLINE

Ὅτι οἱ μὲν ἐν τῷ πρώτῳ περιβόλῳ οὐ προσποιοῦνται ἐπίστασθαι ἃ οὐκ οἴδασιν, οἱ δ' ἐν τῷ δευτέρῳ περιβόλῳ, εἰ μηδὲν ἄλλο, προσποιοῦνταί γε ἐπίστασθαι ἃ οὐκ οἴδασιν. Ἕως δ' ἂν ἔχωσι ταύτην τὴν δόξαν, ἀκινήτους αὐτοὺς ἀνάγκη εἶναι πρὸς τὸ ὁρμᾶν πρὸς τὴν Ἀληθινὴν Παιδείαν. Εἶτα τὸ ἕτερον οὐχ ὁρᾷς, ὅτι καὶ αἱ Δόξαι ἐκ τοῦ πρώτου περιβόλου εἰσπορεύονται πρὸς αὐτοὺς ὁμοίως; Ὥστε οὐδὲν οὗτοι ἐκείνων βελτίους εἰσίν, ἐὰν μὴ καὶ τούτοις συνῇ ἡ Μεταμέλεια, καὶ πεισθῶσιν ὅτι οὐ Παιδείαν ἔχουσιν, ἀλλὰ Ψευδοπαιδείαν, δι' ἧς ἀπατῶνται. — Cebes, Tabula, 35

6 Translate into Greek:

a Because he had no money to build ships Lysander went to Cyrus.

b Men ask why the gifts of fortune are taken away from them.

c He will not march till he has given the sailors the pay that is due them.

7 Explain how Agesilaus happened to be in Phrygia (*a*). Give an account of the condition of the Spartan fleet when Lysander went to Cyrus (*b*).

8 Give the reason for the case of ἱππικὸν (*a*, 2), ἔτει (*b*, :), πολλῷ (*b*, 5), ναυάρχων (*b*, 6), ἴδιον (*c*, 2); for the mode of δέοι (*a*, 3), παρέχοιτο (*a*, 4), μαστεύοι (*a*, 7), ἔχοι (*b*, 6), λάβωσι (*c*, 1).

9 Classify the following participles: ἀφικόμενος (*b*, 1), μνημονεύοντες (*c*, 3). Give the syntax of στρατεύεσθαι (*a*, 1), δραπετεύοντα (*a*, 3), πολεμεῖν (*a*, 3), ἱπποτροφεῖν (*a*, 4), εἶναι (*c*, 2), δοῦναι (*c*, 7). Decline τριήρεις (*b*, 7) in singular and plural.

10 From what verb is each of the following and where is the form found: ἔταξε (*a*, 7), συνήθροισεν (*b*, 2), ἀνηλωμένα εἴη (*b*, 5), πεπονθέναι (*c*, 3), ἀφελέσθαι (*c*, 7)?

11 Write the principal parts of ἐδύνατο (*a*, 1), κατέλεξε (*a*, 4), ἐπέστησε (*b*, 7), ὀφειλόμενον (*b*, 7), ἔχειν (*c*, 5).

12 Conjugate ἐδύνατο (*a*, 1), εἶπεν (*b*, 4) in the voice, mode and tense here found. Write the first form of each mode, including participle, of κελεύει (*c*, 5). Compare ταχέως (*c*, 7).

13 Give the force of οὖν (*a*, 3), the first καὶ in (*c*, 5). Explain the force of the imperfect in ᾔτει (*b*, 4); the contraction in τἀργύριον (*b*, 6); the force of ἀπό in ἀπέδωκε (*b*, 8).

14 Translate into Greek: If Agesilaus had not needed cavalry, he would not have asked the cities to provide him with men, arms and horses. But he thought that he must have cavalry in order to fight the horsemen of the enemy in the plains of Phrygia.

15 Give the composition of each of the following and the meaning of each part: ἱπποτροφεῖν (*a*, 4), τριηράρχους (*b*, 7), μηδὲν (*c*, 4). Explain the formation of the verbal adjective κατασκευαστέον (*a*, 2). Account for the use of μὴ (*a*, 5).

University of the State of New York

High School Department

174TH EXAMINATION

GREEK—Second Year

Tuesday, June 17, 1902—1.15 to 4.15 p. m., only

Answer the first six questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–5 Translate into English:

a NOBLE DESCENT OF AGESILAUS

Οἶδα μὲν ὅτι τῆς Ἀγησιλάου ἀρετῆς τε καὶ δόξης οὐ ῥᾴδιον ἄξιον ἔπαινον γράψαι, ὅμως δ' ἐγχειρητέον. Οὐ γὰρ ἂν καλῶς ἔχοι εἰ, ὅτι τελέως ἀνὴρ ἀγαθὸς ἐγένετο, διὰ τοῦτο οὐδὲ μειόνων ἂν τυγχάνοι ἐπαίνων. Περὶ μὲν οὖν εὐγενείας αὐτοῦ τί ἂν τις μεῖζον καὶ κάλλιον εἰπεῖν ἔχοι ἢ ὅτι ἔτι καὶ νῦν τοῖς προγόνοις ὀνομαζομένοις ἀπομνημονεύεται ὁπόστος ἀφ' Ἡρακλέους ἐγένετο, καὶ τούτοις οὐκ ἰδιώταις ἀλλ' ἐκ βασιλέων βασιλεῦσιν; Ἀλλὰ μὴν οὐδὲ ταύτῃ γ' ἂν τις ἔχοι καταμέμψασθαι αὐτοὺς ὡς βασιλεύουσι μέν, πόλεως δὲ τῆς ἐπιτυχούσης.—Xenophon, Agesilaus, 1

b CALLICRATIDAS TRIES TO SURPRISE THE ATHENIANS

Ὁ δὲ Καλλικρατίδας ἀκούων τὴν βοήθειαν ἤδη ἐν Σάμῳ οὖσαν, αὐτοῦ μὲν κατέλιπε πεντήκοντα ναῦς καὶ ἄρχοντα Ἐτεόνικον, ταῖς δὲ εἴκοσι καὶ ἑκατὸν ἀναχθεὶς ἐδειπνοποιεῖτο τῆς Λέσβου ἐπὶ τῇ Μαλέᾳ ἄκρᾳ ἀντίον τῆς Μυτιλήνης. Τῇ δ' αὐτῇ ἡμέρᾳ ἔτυχον καὶ οἱ Ἀθηναῖοι δειπνοποιούμενοι ἐν ταῖς Ἀργινούσαις· αὗται δ' εἰσὶν ἀντίον τῆς Λέσβου. Τῆς δὲ νυκτὸς ἰδὼν τὰ πυρά, καί τινων αὐτῷ ἐξαγγειλάντων ὅτι οἱ Ἀθηναῖοι εἶεν, ἀνήγετο περὶ μέσας νύκτας, ὡς ἐξαπιναίως προσπέσοι· ὕδωρ δ' ἐπιγενόμενον πολὺ καὶ βρονταὶ διεκώλυσαν τὴν ἀναγωγήν. Ἐπεὶ δὲ ἀνέσχεν, ἅμα τῇ ἡμέρᾳ ἔπλει ἐπὶ τὰς Ἀργινούσας.—Hellenica, 1, 6

c VICTIMS OF FALSE DISCIPLINE

Ὅτι οἱ μὲν ἐν τῷ πρώτῳ περιβόλῳ οὐ προσποιοῦνται ἐπίστασθαι ἃ οὐκ οἴδασιν, οἱ δ' ἐν τῷ δευτέρῳ περιβόλῳ, εἰ μηδὲν ἄλλο, προσποιοῦνταί γε ἐπίστασθαι ἃ οὐκ οἴδασιν. Ἕως δ' ἂν ἔχωσι ταύτην τὴν δόξαν, ἀκινήτους αὐτοὺς ἀνάγκη εἶναι πρὸς τὸ ὁρμᾶν πρὸς τὴν Ἀληθινὴν Παιδείαν. Εἶτα τὸ ἕτερον οὐχ ὁρᾷς, ὅτι καὶ αἱ Δόξαι ἐκ τοῦ πρώτου περιβόλου εἰσπορεύονται πρὸς αὐτοὺς ὁμοίως; Ὥστε οὐδὲν οὗτοι ἐκείνων βελτίους εἰσίν, ἐὰν μὴ καὶ τούτοις συνῇ ἡ Μεταμέλεια, καὶ πεισθῶσιν ὅτι οὐ Παιδείαν ἔχουσιν, ἀλλὰ Ψευδοπαιδείαν, δι' ἧς ἀπατῶνται.—Cebes, Tabula, 35

6 Translate into Greek:

a Because he had no money to build ships Lysander went to Cyrus.

b Men ask why the gifts of fortune are taken away from them.

c He will not march till he has given the sailors the pay that is due them.

7 Explain how Agesilaus happened to be in Phrygia (*a*). Give an account of the condition of the Spartan fleet when Lysander went to Cyrus (*b*).

8 Give the reason for the case of ἱππικὸν (*a*, 2), ἔτει (*b*, 1), πολλῷ (*b*, 5), ναυάρχων (*b*, 6), ἴδιον (*c*, 2); for the mode of δέοι (*a*, 3), παρέχοιτο (*a*, 4), μαστεύοι (*a*, 7), ἔχοι (*b*, 6), λάβωσι (*c*, 1).

9 Classify the following participles: ἀφικόμενος (*b*, 1), μνημονεύοντες (*c*, 3). Give the syntax of στρατεύεσθαι (*a*, 1), δραπετεύοντα (*a*, 3), πολεμεῖν (*a*, 3), ἱπποτροφεῖν (*a*, 4), εἶναι (*c*, 2), δοῦναι (*c*, 7). Decline τριήρεις (*b*, 7) in singular and plural.

10 From what verb is each of the following and where is the form found: ἔταξε (*a*, 7), συνήθροισεν (*b*, 2), ἀνηλωμένα εἴη (*b*, 5), πεπονθέναι (*c*, 3), ἀφελέσθαι (*c*, 7)?

11 Write the principal parts of ἐδύνατο (*a*, 1), κατέλεξε (*a*, 4), ἐπέστησε (*b*, 7), ὀφειλόμενον (*b*, 7), ἔχειν (*c*, 5).

12 Conjugate ἐδύνατο (*a*, 1), εἶπεν (*b*, 4) in the voice, mode and tense here found. Write the first form of each mode, including participle, of κελεύει (*c*, 5). Compare ταχέως (*c*, 7).

13 Give the force of οὖν (*a*, 3), the first καὶ in (*c*, 5). Explain the force of the imperfect in ᾔτει (*b*, 4); the contraction in τἀργύριον (*b*, 6); the force of ἀπό in ἀπέδωκε (*b*, 8).

14 Translate into Greek: If Agesilaus had not needed cavalry, he would not have asked the cities to provide him with men, arms and horses. But he thought that he must have cavalry in order to fight the horsemen of the enemy in the plains of Phrygia.

15 Give the composition of each of the following and the meaning of each part: ἱπποτροφεῖν (*a*, 4), τριηράρχους (*b*, 7), μηδὲν (*c*, 4). Explain the formation of the verbal adjective κατασκευαστέον (*a*, 2). Account for the use of μὴ (*a*, 5).

University of the State of New York

High School Department

174TH EXAMINATION

GREEK—Second Year

Tuesday, June 17, 1902—1.15 to 4.15 p. m., only

Answer the first six questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–5 Translate into English:

a NOBLE DESCENT OF AGESILAUS

Οἶδα μὲν ὅτι τῆς Ἀγησιλάου ἀρετῆς τε καὶ δόξης οὐ ῥᾴδιον ἄξιον ἔπαινον γράψαι, ὅμως δ' ἐγχειρητέον. Οὐ γὰρ ἂν καλῶς ἔχοι εἰ, ὅτι τελέως ἀνὴρ ἀγαθὸς ἐγένετο, διὰ τοῦτο οὐδὲ μειόνων ἂν τυγχάνοι ἐπαίνων. Περὶ μὲν οὖν εὐγενείας αὐτοῦ τί ἂν τις μεῖζον καὶ κάλλιον εἰπεῖν ἔχοι ἢ ὅτι ἔτι καὶ νῦν τοῖς προγόνοις ὀνομαζομένοις ἀπομνημονεύεται ὁπόστος ἀφ' Ἡρακλέους ἐγένετο, καὶ τούτοις οὐκ ἰδιώταις ἀλλ' ἐκ βασιλέων βασιλεῦσιν; Ἀλλὰ μὴν οὐδὲ ταύτῃ γ' ἄν τις ἔχοι καταμέμψασθαι αὐτοὺς ὡς βασιλεύουσι μέν, πόλεως δὲ τῆς ἐπιτυχούσης.—Xenophon, Agesilaus, 1

b CALLICRATIDAS TRIES TO SURPRISE THE ATHENIANS

Ὁ δὲ Καλλικρατίδας ἀκούων τὴν βοήθειαν ἤδη ἐν Σάμῳ οὖσαν, αὐτοῦ μὲν κατέλιπε πεντήκοντα ναῦς καὶ ἄρχοντα Ἐτεόνικον, ταῖς δὲ εἴκοσι καὶ ἑκατὸν ἀναχθεὶς ἐδειπνοποιεῖτο τῆς Λέσβου ἐπὶ τῇ Μαλέᾳ ἄκρᾳ ἀντίον τῆς Μυτιλήνης. Τῇ δ' αὐτῇ ἡμέρᾳ ἔτυχον καὶ οἱ Ἀθηναῖοι δειπνοποιούμενοι ἐν ταῖς Ἀργινούσαις· αὗται δ' εἰσὶν ἀντίον τῆς Λέσβου. Τῆς δὲ νυκτὸς ἰδὼν τὰ πυρά, καί τινων αὐτῷ ἐξαγγειλάντων ὅτι οἱ Ἀθηναῖοι εἶεν, ἀνήγετο περὶ μέσας νύκτας, ὡς ἐξαπιναίως προσπέσοι· ὕδωρ δ' ἐπιγενόμενον πολὺ καὶ βρονταὶ διεκώλυσαν τὴν ἀναγωγήν. Ἐπεὶ δὲ ἀνέσχεν, ἅμα τῇ ἡμέρᾳ ἔπλει ἐπὶ τὰς Ἀργινούσας.—Hellenica, 1, 6

c VICTIMS OF FALSE DISCIPLINE

Ὅτι οἱ μὲν ἐν τῷ πρώτῳ περιβόλῳ οὐ προσποιοῦνται ἐπίστασθαι ἃ οὐκ οἴδασιν, οἱ δ' ἐν τῷ δευτέρῳ περιβόλῳ, εἰ μηδὲν ἄλλο, προσποιοῦνταί γε ἐπίστασθαι ἃ οὐκ οἴδασιν. Ἕως δ' ἂν ἔχωσι ταύτην τὴν δόξαν, ἀκινήτους αὐτοὺς ἀνάγκη εἶναι πρὸς τὸ ὁρμᾶν πρὸς τὴν Ἀληθινὴν Παιδείαν. Εἶτα τὸ ἕτερον οὐχ ὁρᾷς, ὅτι καὶ αἱ Δόξαι ἐκ τοῦ πρώτου περιβόλου εἰσπορεύονται πρὸς αὐτοὺς ὁμοίως; Ὥστε οὐδὲν οὗτοι ἐκείνων βελτίους εἰσίν, ἐὰν μὴ καὶ τούτοις συνῇ ἡ Μεταμέλεια, καὶ πεισθῶσιν ὅτι οὐ Παιδείαν ἔχουσιν, ἀλλὰ Ψευδοπαιδεών, δι' ἧς ἀπατῶνται.—Cebes, Tabula, 35

6 Translate into Greek:

a Because he had no money to build ships Lysander went to Cyrus.

b Men ask why the gifts of fortune are taken away from them.

c He will not march till he has given the sailors the pay that is due them.

7 Explain how Agesilaus happened to be in Phrygia (*a*). Give an account of the condition of the Spartan fleet when Lysander went to Cyrus (*b*).

8 Give the reason for the case of ἱππικὸν (*a*, 2), ἔτει (*b*, 1), πολλῷ (*b*, 5), ναυάρχων (*b*, 6), ἴδιον (*c*, 2); for the mode of δέοι (*a*, 3), παρέχοιτο (*a*, 4), μαστεύοι (*a*, 7), ἔχοι (*b*, 6), λάβωσι (*c*, 1).

9 Classify the following participles: ἀφικόμενος (*b*, 1), μνημονεύοντες (*c*, 3). Give the syntax of στρατεύεσθαι (*a*, 1), δραπετεύοντα (*a*, 3), πολεμεῖν (*a*, 3), ἱπποτροφεῖν (*a*, 4), εἶναι (*c*, 2), δοῦναι (*c*, 7). Decline τριήρεις (*b*, 7) in singular and plural.

10 From what verb is each of the following and where is the form found: ἔταξε (*a*, 7), συνήθροισεν (*b*, 2), ἀνηλωμένα εἴη (*b*, 5), πεπονθέναι (*c*, 3), ἀφελέσθαι (*c*, 7)?

11 Write the principal parts of ἐδύνατο (*a*, 1), κατέλεξε (*a*, 4), ἐπέστησε (*b*, 7), ὀφειλόμενον (*b*, 7), ἔχειν (*c*, 5).

12 Conjugate ἐδύνατο (*a*, 1), εἶπεν (*b*, 4) in the voice, mode and tense here found. Write the first form of each mode, including participle, of κελεύει (*c*, 5). Compare ταχέως (*c*, 7).

13 Give the force of οὖν (*a*, 3), the first καὶ in (*c*, 5). Explain the force of the imperfect in ᾔτει (*b*, 4); the contraction in τἀργύριον (*b*, 6); the force of ἀπό in ἀπέδωκε (*b*, 8).

14 Translate into Greek: If Agesilaus had not needed cavalry, he would not have asked the cities to provide him with men, arms and horses. But he thought that he must have cavalry in order to fight the horsemen of the enemy in the plains of Phrygia.

15 Give the composition of each of the following and the meaning of each part: ἱπποτροφεῖν (*a*, 4), τριηράρχους (*b*, 7), μηδὲν (*c*, 4). Explain the formation of the verbal adjective κατασκευαστέον (*a*, 2). Account for the use of μὴ (*a*, 5).

High School Department

174TH EXAMINATION

GREEK — Second Year

Tuesday, June 17, 1902 — 1.15 to 4.15 p. m., only

Answer the first six questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–5 Translate into English:

a NOBLE DESCENT OF AGESILAUS

Οἶδα μὲν ὅτι τῆς Ἀγησιλάου ἀρετῆς τε καὶ δόξης οὐ ῥᾴδιον ἄξιον ἔπαινον γράψαι, ὅμως δ' ἐγχειρητέον. Οὐ γὰρ ἂν καλῶς ἔχοι εἰ, ὅτι τελέως ἀνὴρ ἀγαθὸς ἐγένετο, διὰ τοῦτο οὐδὲ μειόνων ἂν τυγχάνοι ἐπαίνων. Περὶ μὲν οὖν εὐγενείας αὐτοῦ τί ἂν τις μεῖζον καὶ κάλλιον εἰπεῖν ἔχοι ἢ ὅτι ἔτι καὶ νῦν τοῖς προγόνοις ὀνομαζομένοις ἀπομνημονεύεται ὁπόστος ἀφ' Ἡρακλέους ἐγένετο, καὶ τούτοις οὐκ ἰδιώταις ἀλλ' ἐκ βασιλέων βασιλεῦσιν; Ἀλλὰ μὴν οὐδὲ ταύτῃ γ' ἂν τις ἔχοι καταμέμψασθαι αὐτοὺς ὡς βασιλεύουσι μέν, πόλεως δὲ τῆς ἐπιτυχούσης. — Xenophon, Agesilaus, 1

b CALLICRATIDAS TRIES TO SURPRISE THE ATHENIANS

Ὁ δὲ Καλλικρατίδας ἀκούων τὴν βοήθειαν ἤδη ἐν Σάμῳ οὖσαν, αὐτοῦ μὲν κατέλιπε πεντήκοντα ναῦς καὶ ἄρχοντα Ἐτεόνικον, ταῖς δὲ εἴκοσι καὶ ἑκατὸν ἀναχθεὶς ἐδειπνοποιεῖτο τῆς Λέσβου ἐπὶ τῇ Μαλέᾳ ἄκρᾳ ἀντίον τῆς Μυτιλήνης. Τῇ δ' αὐτῇ ἡμέρᾳ ἔτυχον καὶ οἱ Ἀθηναῖοι δειπνοποιούμενοι ἐν ταῖς Ἀργινούσαις· αὗται δ' εἰσὶν ἀντίον τῆς Λέσβου. Τῆς δὲ νυκτὸς ἰδὼν τὰ πυρά, καί τινων αὐτῷ ἐξαγγειλάντων ὅτι οἱ Ἀθηναῖοι εἶεν, ἀνήγετο περὶ μέσας νύκτας, ὡς ἐξαπιναίως προσπέσοι· ὕδωρ δ' ἐπιγενόμενον πολὺ καὶ βρονταὶ διεκώλυσαν τὴν ἀναγωγήν. Ἐπεὶ δὲ ἀνέσχεν, ἅμα τῇ ἡμέρᾳ ἔπλει ἐπὶ τὰς Ἀργινούσας. — Hellenica, 1, 6

c VICTIMS OF FALSE DISCIPLINE

Ὅτι οἱ μὲν ἐν τῷ πρώτῳ περιβόλῳ οὐ προσποιοῦνται ἐπίστασθαι ἃ οὐκ οἴδασιν, οἱ δ' ἐν τῷ δευτέρῳ περιβόλῳ, εἰ μηδὲν ἄλλο, προσποιοῦνταί γε ἐπίστασθαι ἃ οὐκ οἴδασιν. Ἕως δ' ἂν ἔχωσι ταύτην τὴν δόξαν, ἀκινήτους αὐτοὺς ἀνάγκη εἶναι πρὸς τὸ ὁρμᾶν πρὸς τὴν Ἀληθινὴν Παιδείαν. Εἶτα τὸ ἕτερον οὐχ ὁρᾷς, ὅτι καὶ αἱ Δόξαι ἐκ τοῦ πρώτου περιβόλου εἰσπορεύονται πρὸς αὐτοὺς ὁμοίως; Ὥστε οὐδὲν οὗτοι ἐκείνων βελτίους εἰσίν, ἐὰν μὴ καὶ τούτοις συνῇ ἡ Μεταμέλεια, καὶ πεισθῶσιν ὅτι οὐ Παιδείαν ἔχουσιν, ἀλλὰ Ψευδοπαιδείαν, δι' ἧς ἀπατῶνται. — Cebes, Tabula, 35

6 Translate into Greek:

a Because he had no money to build ships Lysander went to Cyrus.

b Men ask why the gifts of fortune are taken away from them.

c He will not march till he has given the sailors the pay that is due them.

7 Explain how Agesilaus happened to be in Phrygia (*a*). Give an account of the condition of the Spartan fleet when Lysander went to Cyrus (*b*).

8 Give the reason for the case of ἱππικὸν (*a*, 2), ἔτει (*b*, :), πολλῷ (*b*, 5), ναυάρχων (*b*, 6), ἴδιον (*c*, 2); for the mode of δέοι (*a*, 3), παρέχοιτο (*a*, 4), μαστεύοι (*a*, 7), ἔχοι (*b*, 6), λάβωσι (*c*, 1).

9 Classify the following participles: ἀφικόμενος (*b*, 1), μνημονεύοντες (*c*, 3). Give the syntax of στρατεύεσθαι (*a*, 1), δραπετεύοντα (*a*, 3), πολεμεῖν (*a*, 3), ἱπποτροφεῖν (*a*, 4), εἶναι (*c*, 2), δοῦναι (*c*, 7). Decline τριήρεις (*b*, 7) in singular and plural.

10 From what verb is each of the following and where is the form found: ἔταξε (*a*, 7), συνήθροισεν (*b*, 2), ἀνηλωμένα εἴη (*b*, 5), πεπονθέναι (*c*, 3), ἀφελέσθαι (*c*, 7)?

11 Write the principal parts of ἐδύνατο (*a*, 1), κατέλεξε (*a*, 4), ἐπέστησε (*b*, 7), ὀφειλόμενον (*b*, 7), ἔχειν (*c*, 5).

12 Conjugate ἐδύνατο (*a*, 1), εἶπεν (*b*, 4) in the voice, mode and tense here found. Write the first form of each mode, including participle, of κελεύει (*c*, 5). Compare ταχέως (*c*, 7).

13 Give the force of οὖν (*a*, 3), the first καὶ in (*c*, 5). Explain the force of the imperfect in ᾔτει (*b*, 4); the contraction in τἀργύριον (*b*, 6); the force of ἀπό in ἀπέδωκε (*b*, 8).

14 Translate into Greek: If Agesilaus had not needed cavalry, he would not have asked the cities to provide him with men, arms and horses. But he thought that he must have cavalry in order to fight the horsemen of the enemy in the plains of Phrygia.

15 Give the composition of each of the following and the meaning of each part: ἱπποτροφεῖν (*a*, 4), τριηράρχους (*b*, 7), μηδὲν (*c*, 4). Explain the formation of the verbal adjective κατασκευαστέον (*a*, 2). Account for the use of μὴ (*a*, 5).

University of the State of New York

High School Department

174TH EXAMINATION

GREEK—Second Year

Tuesday, June 17, 1902—1.15 to 4.15 p. m., only

Answer the first six questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–5 Translate into English:

a NOBLE DESCENT OF AGESILAUS

Οἶδα μὲν ὅτι τῆς Ἀγησιλάου ἀρετῆς τε καὶ δόξης οὐ ῥᾴδιον ἄξιον ἔπαινον γράψαι, ὅμως δ' ἐγχειρητέον. Οὐ γὰρ ἂν καλῶς ἔχοι εἰ, ὅτι τελέως ἀνὴρ ἀγαθὸς ἐγένετο, διὰ τοῦτο οὐδὲ μειόνων ἂν τυγχάνοι ἐπαίνων. Περὶ μὲν οὖν εὐγενείας αὐτοῦ τί ἄν τις μεῖζον καὶ κάλλιον εἰπεῖν ἔχοι ἢ ὅτι ἔτι καὶ νῦν τοῖς προγόνοις ὀνομαζομένοις ἀπομνημονεύεται ὁπόστος ἀφ' Ἡρακλέους ἐγένετο, καὶ τούτοις οὐκ ἰδιώταις ἀλλ' ἐκ βασιλέων βασιλεῦσιν; Ἀλλὰ μὴν οὐδὲ ταύτῃ γ' ἄν τις ἔχοι καταμέμψασθαι αὐτοὺς ὡς βασιλεύουσι μέν, πόλεως δὲ τῆς ἐπιτυχούσης.—Xenophon, Agesilaus, 1

b CALLICRATIDAS TRIES TO SURPRISE THE ATHENIANS

Ὁ δὲ Καλλικρατίδας ἀκούων τὴν βοήθειαν ἤδη ἐν Σάμῳ οὖσαν, αὐτοῦ μὲν κατέλιπε πεντήκοντα ναῦς καὶ ἄρχοντα Ἐτεόνικον, ταῖς δὲ εἴκοσι καὶ ἑκατὸν ἀναχθεὶς ἐδειπνοποιεῖτο τῆς Λέσβου ἐπὶ τῇ Μαλέᾳ ἄκρᾳ ἀντίον τῆς Μυτιλήνης. Τῇ δ' αὐτῇ ἡμέρᾳ ἔτυχον καὶ οἱ Ἀθηναῖοι δειπνοποιούμενοι ἐν ταῖς Ἀργινούσαις· αὗται δ' εἰσὶν ἀντίον τῆς Λέσβου. Τῆς δὲ νυκτὸς ἰδὼν τὰ πυρά, καί τινων αὐτῷ ἐξαγγειλάντων ὅτι οἱ Ἀθηναῖοι εἶεν, ἀνήγετο περὶ μέσας νύκτας, ὡς ἐξαπιναίως προσπέσοι· ὕδωρ δ' ἐπιγενόμενον πολὺ καὶ βρονταὶ διεκώλυσαν τὴν ἀναγωγήν. Ἐπεὶ δὲ ἀνέσχεν, ἅμα τῇ ἡμέρᾳ ἔπλει ἐπὶ τὰς Ἀργινούσας.—Hellenica, 1, 6

c VICTIMS OF FALSE DISCIPLINE

Ὅτι οἱ μὲν ἐν τῷ πρώτῳ περιβόλῳ οὐ προσποιοῦνται ἐπίστασθαι ἃ οὐκ οἴδασιν, οἱ δ' ἐν τῷ δευτέρῳ περιβόλῳ, εἰ μηδὲν ἄλλο, προσποιοῦνταί γε ἐπίστασθαι ἃ οὐκ οἴδασιν. Ἕως δ' ἂν ἔχωσι ταύτην τὴν δόξαν, ἀκινήτους αὐτοὺς ἀνάγκη εἶναι πρὸς τὸ ὁρμᾶν πρὸς τὴν Ἀληθινὴν Παιδείαν. Εἶτα τὸ ἕτερον οὐχ ὁρᾷς, ὅτι καὶ αἱ Δόξαι ἐκ τοῦ πρώτου περιβόλου εἰσπορεύονται πρὸς αὐτοὺς ὁμοίως; Ὥστε οὐδὲν οὗτοι ἐκείνων βελτίους εἰσίν, ἐὰν μὴ καὶ τούτοις συνῇ ἡ Μεταμέλεια, καὶ πεισθῶσιν ὅτι οὐ Παιδείαν ἔχουσιν, ἀλλὰ Ψευδοπαιδείαν, δι' ἧς ἀπατῶνται.—Cebes, Tabula, 35

6 Translate into Greek:

a Would it not be well if a good man should receive praise for his virtue?

b If they knew what they pretended to know, they would not be deceived.

c Do not attempt to write till I tell you.

7 Give an account of the battle that followed the events mentioned in (*b*) and state its results.

8 Give the reason for the case of ἀρετῆς (*a*, 1), ἐπαίνων (*a*, 3), προγόνοις (*a*, 5), ἡμέρᾳ (*b*, 4), νυκτὸς (*b*, 5), ἐκείνων (*c*, 6), τούτοις (*c*, 7); for the mode of γράψαι (*a*, 2), εἰπεῖν (*a*, 4), ὁρμᾶν (*c*, 4).

9 Give the reason for the mode of τυγχάνοι (*a*, 3), ἔχοι (*a*, 4), εἶεν (*b*, 6), προσπέσοι (*b*, 7), ἔχωσι (*c*, 3), συνῇ (*c*, 7). Explain the construction of οὖσαν (*b*, 1), δειπνοποιούμενοι (*b*, 4), ἐξαγγειλάντων (*b*, 6). Compare βελτίους (*c*, 6).

10 From what verb is each of the following and where is the form found: ἐγένετο (*a*, 3), καταμέμψασθαι (*a*, 7), ἀναχθεὶς (*b*, 3), ἀνέσχεν (*b*, 8), πεισθῶσιν (*c*, 7)?

11 Conjugate ἔτυχον (*b*, 4), συνῇ (*c*, 7) in the voice, mode and tense here found. Write the first form of each mode, including participle, of ἐγένετο (*a*, 3), in the voice and tense here found. Compare ῥᾴδιον (*a*, 1).

12 Write the principal parts of γράψαι (*a*, 2), τυγχάνοι (*a*, 3), ἀκούων (*b*, 1), κατέλιπε (*b*, 2), ὁρᾷς (*c*, 5).

13 Give the force of καὶ (*a*, 5), ἤδη (*b*, 1), γε (*c*, 2). Explain the force of the tense of ἀνήγετο (*b*, 6). Give the correlative of οἱ μὲν (*c*, 1).

14 Translate into Greek: When Callicratidas saw the fires of the Athenians he wished to make an attack the same night, but a heavy rain came up and hindered him from sailing. As soon as the rain stopped he put to sea.

15 Give the composition of *each* of the following words and the meaning of each part: εὐγενείας (*a*, 4), ἀναγωγήν (*b*, 8), περιβόλῳ (*c*, 1). State the connection of *each* of the following with the story of the *Tabula:* Μεταμέλεια (*c*, 7), Ψευδοπαιδείαν (*c*, 8).

University of the State of New York

High School Department

172D EXAMINATION

GREEK—Third Year

Thursday, January 30, 1902—1.15 to 4.15 p. m., only

Answer the first seven questions and three of the others but **no more.** *If more than three of the others are answered only the first three answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–5 Translate into English:

a ODYSSEUS TALKS WITH THE GHOST OF ACHILLES

Ὣς ἔφατ', αὐτὰρ ἐγώ μιν ἀμειβόμενος προσέειπον·
"ἦ τοι μὲν Πηλῆος ἀμύμονος οὔ τι πέπυσμαι,
αὐτάρ τοι παιδός γε Νεοπτολέμοιο φίλοιο
πᾶσαν ἀληθείην μυθήσομαι, ὥς με κελεύεις·
αὐτὸς γάρ μιν ἐγὼ κοίλης ἐπὶ νηὸς ἐίσης
ἤγαγον ἐκ Σκύρου μετ' ἐυκνήμιδας Ἀχαιούς.
ἦ τοι ὅτ' ἀμφὶ πόλιν Τροίην φραζοίμεθα βουλὰς,
αἰεὶ πρῶτος ἔβαζε καὶ οὐχ ἡμάρτανε μύθων·
Νέστωρ τ' ἀντίθεος καὶ ἐγὼ νικάσκομεν οἴω."

—Homer, Odyssey, 11, 504–512

βάζω=speak

b CYRUS POSSESSES THE POWER OF DIVINATION

Προϊόντι δὲ τῷ Κύρῳ ὁ πατὴρ ἤρχετο λόγου τοιοῦδε. Ὦ παῖ, ὅτι μὲν οἱ θεοὶ ἵλεῴ τε καὶ εὐμενεῖς πέμπουσί σε καὶ ἐν ἱεροῖς δῆλον καὶ ἐν οὐρανίοις σημείοις· γιγνώσκεις δὲ καὶ αὐτός. Ἐγὼ γάρ σε ταῦτα ἐπίτηδες ἐδιδαξάμην, ὅπως μὴ δι' ἄλλων ἑρμηνέων τὰς τῶν θεῶν συμβουλίας συνείης, ἀλλ' αὐτὸς καὶ ὁρῶν τὰ ὁρατὰ καὶ ἀκούων τὰ ἀκουστὰ γιγνώσκοις καὶ μὴ ἐπὶ μάντεσιν εἴης, εἰ βούλοιντό σε ἐξαπατᾶν ἕτερα λέγοντες ἢ τὰ παρὰ τῶν θεῶν σημαινόμενα.—Xenophon, Cyropaedia, 1, 6

ἐπίτηδες=advisedly, συνίημι=understand

c TISSAPHERNES IS EXECUTED

Γνοὺς δὲ καὶ αὐτὸς ὁ Περσῶν βασιλεὺς Τισσαφέρνην αἴτιον εἶναι τοῦ κακῶς φέρεσθαι τὰ αὐτοῦ, Τιθραύστην καταπέμψας ἀποτέμνει αὐτοῦ τὴν κεφαλήν. Τοῦτο δὲ ποιήσας ὁ Τιθραύστης πέμπει πρὸς τὸν Ἀγησίλαον πρέσβεις λέγοντας· Ὦ Ἀγησίλαε, ὁ μὲν αἴτιος τῶν πραγμάτων καὶ ὑμῖν καὶ ἡμῖν ἔχει τὴν δίκην· βασιλεὺς δὲ ἀξιοῖ σὲ μὲν ἀποπλεῖν οἴκαδε, τὰς δ' ἐν τῇ Ἀσίᾳ πόλεις αὐτονόμους οὔσας τὸν ἀρχαῖον δασμὸν αὐτῷ ἀποφέρειν.

—Hellenica, 3, 4

κακῶς φέρομαι=be unsuccessful, δασμός=tribute

6 Translate into Greek: *a*) Odysseus told Achilles that Neoptolemus was excelled in speaking only by Nestor, *b*) If our affairs are unsuccessful, I am not to blame, *c*) Let the culprit pay the penalty.

7 Translate into Greek: *a*) Would that I had known what the gods wished me to do, *b*) Messengers were sent to the king, urging him to go away in order that he might not be deceived and that his ships might not be taken.

8 Give the reason for the case of Πηλῆος (*a*, 2), *μύθων* (*a*, 8), *θεῶν* (*b*, 4), *αἴτιον* (*c*, 1), *πραγμάτων* (*c*, 4), *ὑμῖν* (*c*, 4); for the mode of *φραζοίμεθα* (*a*, 7), *συνείης* (*b*, 4), *βούλοιντό* (*b*, 6), *ἀποπλεῖν* (*c*, 5).

9 Translate into English:

Ἐνταῦθα ἵσταντο οἱ πολέμιοι· καὶ ἐπεὶ ἤρξαντο καταβαίνειν ἀπὸ τοῦ μαστοῦ πρὸς τοὺς ἄλλους, ἔνθα τὰ ὅπλα ἔκειντο, ἵεντο δὴ οἱ πολέμιοι πολλῷ πλήθει καὶ θορύβῳ· καὶ ἐπεὶ ἐγένοντο ἐπὶ τῆς κορυφῆς τοῦ μαστοῦ ἀφ' οὗ Ξενοφῶν κατέβαινεν, ἐκυλίνδουν πέτρας.—Xenophon, Anabasis, 4, 2

μαστός=hill, *κορυφή*=summit, *κυλινδέω*=roll

10 Translate into English:

Ἐμοὶ μὲν δὴ Σωκράτης τοιοῦτος ὢν ἐδόκει τιμῆς ἄξιος εἶναι μᾶλλον ἢ θανάτου. Καὶ κατὰ τοὺς νόμους δὲ σκοπῶν ἄν τις τοῦθ' εὕροι. Κατὰ γὰρ τοὺς νόμους, ἐάν τις φανερὸς γένηται κλέπτων ἢ ἱεροσυλῶν, τούτοις θάνατός ἐστιν ἡ ζημία· ὧν ἐκεῖνος πάντων ἀνθρώπων πλεῖστον ἀπεῖχεν. Ἀλλὰ μὴν τῇ πόλει γε οὔτε πολέμου κακῶς συμβάντος, οὔτε ἄλλου κακοῦ οὐδενὸς πώποτε αἴτιος ἐγένετο.—Memorabilia, 1, 2

ἱεροσυλέω=rob a temple, *ζημία*=punishment

11 Translate into Greek: If Socrates had not lived in accordance with the laws and had not held aloof from wicked men, he would have deserved death; but he did none of these things, therefore he is worthy of honor.

12 Translate into English:

"καί ποτέ τις εἴπῃσιν ἰδὼν κατὰ δάκρυ χέουσαν
'Ἕκτορος ἥδε γυνή, ὃς ἀριστεύεσκε μάχεσθαι
Τρώων ἱπποδάμων, ὅτε Ἴλιον ἀμφεμάχοντο.'
ὥς ποτέ τις ἐρέει· σοὶ δ' αὖ νέον ἔσσεται ἄλγος
χήτεϊ τοιοῦδ' ἀνδρός, ἀμύνειν δούλιον ἦμαρ."—Homer, Iliad, 6, 459–463

χῆτος=need

13 Translate into English:

Ἐν δὲ τῷ αὐτῷ χειμῶνι οἱ Ἀθηναῖοι, τῷ πατρίῳ νόμῳ χρώμενοι, δημοσίᾳ ταφὰς ἐποιήσαντο τῶν ἐν τῷδε τῷ πολέμῳ πρῶτον ἀποθανόντων. Τιθέασιν οὖν ἐς τὸ δημόσιον σῆμα, ὅ ἐστιν ἐπὶ τοῦ καλλίστου προαστείου τῆς πόλεως, καὶ ἀεὶ ἐν αὐτῷ θάπτουσι τοὺς ἐκ τῶν πολέμων, πλήν γε τοὺς ἐν Μαραθῶνι.

—Thucydides, Peloponnesian war, 2, 34

δημοσίᾳ=at public expense, *σῆμα*=tomb, *προάστειον*=suburb

14 Give an account of *two* of the following: battle of Cunaxa and its results, return of Odysseus, Peloponnesian war, death of Socrates.

15 Write and translate Greek sentences illustrating *three* of the following: accusative of extent, supplementary participle, dative of the agent, predicate genitive, conditional relative of the future less vivid form.

University of the State of New York

High School Department

174TH EXAMINATION

GREEK — Third Year

Thursday, June 19, 1902 — 1.15 to 4.15 p. m., only

Answer the first seven questions and three of the others but **no more.** *If more than three of the others are answered only the first three answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–5 Translate into English:

a POSEIDON RAISES A STORM

Ὣς εἰπὼν σύναγεν νεφέλας, ἐτάραξε δὲ πόντον
χερσὶ τρίαιναν ἑλών· πάσας δ' ὀρόθυνεν ἀέλλας
παντοίων ἀνέμων, σὺν δὲ νεφέεσσι κάλυψε
γαῖαν ὁμοῦ καὶ πόντον· ὀρώρει δ' οὐρανόθεν νύξ.
σὺν δ' Εὖρός τε Νότος τ' ἔπεσε Ζέφυρός τε δυσαής
καὶ Βορέης αἰθρηγενέτης, μέγα κῦμα κυλίνδων.
καὶ τότ' Ὀδυσσῆος λύτο γούνατα καὶ φίλον ἦτορ,
ὀχθήσας δ' ἄρα εἶπε πρὸς ὃν μεγαλήτορα θυμόν.

—Homer, Odyssey, 5, 291–298

ὀροθύνω = rouse, ἄελλα = blast, δυσαής = ill-blowing, ὀχθέω = be vexed

b THE BATTLE FOR THE HIGHTS

Καὶ τὴν μὲν νύκτα ἐνταῦθα διήγαγον· ἐπεὶ δ' ἡμέρα ὑπέφαινεν, ἐπορεύοντο σιγῇ συντεταγμένοι ἐπὶ τοὺς πολεμίους· καὶ γὰρ ὁμίχλη ἐγένετο, ὥστ' ἔλαθον ἐγγὺς προσελθόντες. Ἐπεὶ δὲ εἶδον ἀλλήλους, ἥ τε σάλπιγξ ἐπεφθέγξατο καὶ ἀλαλάξαντες ἵεντο ἐπὶ τοὺς ἀνθρώπους· οἱ δ' οὐκ ἐδέξαντο, ἀλλὰ λιπόντες τὴν ὁδὸν φεύγοντες ὀλίγοι ἀπέθνησκον· εὔζωνοι γὰρ ἦσαν. Οἱ δὲ ἀμφὶ Χειρίσοφον, ἀκούσαντες τῆς σάλπιγγος, εὐθὺς ἵεντο ἄνω κατὰ τὴν φανερὰν ὁδόν· ἄλλοι δὲ τῶν στρατηγῶν κατὰ ἀτριβεῖς ὁδοὺς ἐπορεύοντο ᾗ ἔτυχον ἕκαστοι ὄντες. — Xenophon, Anabasis, 4, 2

ὑποφαίνω = begin to dawn, ὁμίχλη = fog, ἀλαλάζω = shout the war-cry, ἀτριβής = untrodden

c CYRUS ADDRESSES THE PERSIAN SOLDIERS

Οὕτω δὴ ὁ Κῦρος καταθεὶς τὰ ὅπλα καὶ συγκαλέσας πάντας τοὺς Περσῶν στρατιώτας ἔλεξε τοιάδε. Ἄνδρες Πέρσαι, ὑμεῖς καὶ ἔφυτε ἐν τῇ αὐτῇ ἡμῖν καὶ ἐτράφητε, καὶ τὰ σώματά τε οὐδὲν ἡμῶν χείρονα ἔχετε, ψυχάς τε οὐδὲν κακίονας ὑμῖν προσήκει ἡμῶν ἔχειν. Τοιοῦτοι δ' ὄντες ἐν μὲν τῇ πατρίδι οὐ μετείχετε τῶν ἴσων ἡμῖν. Νῦν δὲ ὅπως μὲν ταῦτα ἕξετε ἐμοὶ μελήσει σὺν τοῖς θεοῖς· ἔξεστι δ' ὑμῖν, εἰ βούλεσθε, λαβόντας ὅπλα οἷάπερ ἡμεῖς ἔχομεν εἰς τὸν αὐτὸν ἡμῖν κίνδυνον ἐμβαίνειν, καὶ ἄν τι ἐκ τούτων καλὸν κἀγαθὸν γίγνηται, τῶν ὁμοίων ἡμῖν ἀξιοῦσθαι. — Cyropaedia, 2, 1

ἔφυν = was born

6 Translate into Greek: (*a*) If the sea had not been stirred up, the waves would not have been very large, (*b*) Cyrus called all the soldiers together in order that he might speak to them, (*c*) They proceeded silently so that the fugitives did not hear them.

7 Translate into Greek: Cyrus said that the Persians should share all things equally with him, that if they wished, they could take arms and encounter the same dangers as he, and that he would see to it that they were honored.

8 Give the reason for the case of χερσὶ (*a*, 2), ἀνέμων (*a*, 3), σάλπιγγος (*b*, 6), στρατηγῶν (*b*, 7), ἡμῖν (*c*, 3), ἡμῶν (*c*, 4), ἴσων (*c*, 5), ὑμῖν (*c*, 6); for the mode of ἔχειν (*c*, 4), γίγνηται (*c*, 8).

9 Translate into English:

Καὶ εὔχετο δὲ πρὸς τοὺς θεοὺς ἁπλῶς τἀγαθὰ διδόναι, ὡς τοὺς θεοὺς κάλλιστα εἰδότας, ὁποῖα ἀγαθά ἐστι· τοὺς δ᾽ εὐχομένους χρυσίον ἢ ἀργύριον ἢ ἄλλο τι τῶν τοιούτων οὐδὲν διάφορον ἐνόμιζεν εὔχεσθαι, ἢ εἰ μάχην ἢ ἄλλο τι εὔχοιντο τῶν φανερῶς ἀδήλων ὅπως ἀποβήσοιτο.

—Xenophon, Memorabilia, 1, 3

ἁπλῶς = simply, διάφορος = different, ἀποβαίνω = result

10 Translate into English:

Ἐκ δὲ τούτου πέμψας Κῦρος ἀγγέλους εἰς Λακεδαίμονα ἠξίου, οἷόσπερ αὐτὸς Λακεδαιμονίοις ἦν ἐν τῷ πρὸς Ἀθηναίους πολέμῳ, τοιούτους καὶ Λακεδαιμονίους αὐτῷ γίγνεσθαι. Οἱ δ᾽ ἔφοροι δίκαια νομίσαντες λέγειν αὐτὸν Σαμίῳ τῷ τότε ναυάρχῳ ἐπέστειλαν ὑπηρετεῖν Κύρῳ, εἴ τι δέοιτο.—Hellenica, 3, 1

ἔφορος = ephor

11 Translate into Greek: (*a*) O that he had escaped the notice of the enemy as he went away, (*b*) When we see the men drawn up, we shall rush to take them, (*c*) Your bodies are not weaker than ours, why should your souls be weaker than ours?

12 Translate into English:

ὣς εἰπὼν ὤτρυνε μένος καὶ θυμὸν ἑκάστου.
ἔνθ᾽ αὖ Σαρπηδὼν μάλα νείκεσεν Ἕκτορα δῖον.
"Ἕκτορ, πῇ δή τοι μένος οἴχεται, ὃ πρὶν ἔχεσκες;
φῆς που ἄτερ λαῶν πόλιν ἑξέμεν ἠδ᾽ ἐπικούρων
οἶος, σὺν γαμβροῖσι κασιγνήτοισί τε σοῖσιν."—Homer, Iliad, 5, 470–474

γαμβρός = brother-in-law

13 Translate into English:

Ἔτι δέ, ὦ Σώκρατες, οὐδὲ δίκαιόν μοι δοκεῖς ἐπιχειρεῖν πρᾶγμα, σαυτὸν προδοῦναι, ἐξὸν σωθῆναι· καὶ τοιαῦτα σπεύδεις περὶ σεαυτὸν γενέσθαι, ἅπερ ἂν καὶ οἱ ἐχθροί σου σπεύσαιέν τε καὶ ἔσπευσαν σὲ διαφθεῖραι βουλόμενοι. Πρὸς δὲ τούτοις καὶ τοὺς υἱεῖς τοὺς σαυτοῦ ἔμοιγε δοκεῖς προδιδόναι.

Plato, Crito, 5

διαφθείρω = destroy

14 Give an account of *two* of the following: search of Telemachus for Odysseus, the anger of Achilles, retreat of the 10,000, Xenophon as a historian.

15 Write and translate Greek sentences illustrating the following: dative of advantage, infinitive expressing result, accusative of specification, genitive of time, indirect question.

University of the State of New York

High School Department

172D EXAMINATION

GREEK PROSE COMPOSITION

Wednesday, January 29, 1902—9.15 a. m. to 12.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

Translate into Greek:

1 An army must be collected at once in order that we may besiege the city.

2 We fear that the enemy will come to attack us both by land and by sea.

3 Do not hinder the horsemen from crossing the plain and reaching the river.

4 Could any one say that Agesilaus was not brave and just and kind to his friends?

5 Alcibiades did not happen to be present when the Athenians promised the ambassadors not to make war.

6–7 The Greeks send messengers to Cyrus to ask him what he intends to do. Cyrus replies that he wishes to punish Abrocomas, a personal enemy, who is near the Euphrates river, but that he will not go in pursuit, if Abrocomas shall flee.

8–9 Cyrus sent for Lysander and forbade him to engage in a naval battle with the Athenians, till the Lacedaemonians should have many more ships. Cyrus said that he had much money and could provide many ships. Then taking all the tribute from the cities which were his own, he gave it to Lysander.

10–12 The barbarians brought this message to the Greeks: "If you plan to do harm to us, you will also harm yourselves. If we wish to destroy you, we are able to do so without incurring danger. We have provisions but you lack them. If we should be conquered, we would burn up the provisions and without these you could not fight. Since we have such resources for conquering you, why should we deceive you?"

13–15 There are many witnesses of the deeds done by Agesilaus. But witnesses are not needed. It is necessary for us only to mention his deeds and we are believed. He loved what was good and refrained from what was bad. He always abode by his oaths so that his enemies trusted him. Had he deceived them they would have hesitated before going to him.

punish = *δίκην ἐπιτίθημι*, forbid = *οὐκ ἐάω*, engage in a naval battle = *ναυμαχέω*, tribute = *φόρος*, resources = *πόροι*, witnesses = *μάρτυρες*, abide by = *ἐμμένω*, hesitate = *ὀκνέω*

High School Department

174TH EXAMINATION

GREEK PROSE COMPOSITION

Wednesday, June 18, 1902—9.15 a. m. to 12.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

Translate into Greek:

1 The messengers must be heard before we promise to become allies of the king.

2 The soldiers marched rapidly so that they reached the mountains at daybreak without hindrance.

3 Do not say that you fear that the army of the enemy is much larger than your own.

4 If we remain here till the generals come, we shall know what they wish us to do.

5 If Agesilaus had not been considered worthy to rule because of his birth, he would not have been chosen king.

6–7 Tissaphernes did not trust Agesilaus so he placed his cavalry in the plain to see what the Greeks were doing. He thought that Agesilaus intended to go to Caria. But instead of going forward, Agesilaus turned round and marched for many days, taking provisions for the army wherever he could.

8–9 If the Greeks should go away now, they would seem to break their treaties. They would have no provisions and no guides. The enemy could prevent them from crossing the river. Though they should go away by day or by night they could not escape the notice of the enemy.

10–12 Persuaded by Menon, some of the soldiers crossed the river before the rest of the army made a reply. When Cyrus saw them crossing, he was pleased and sent word to them that now he praised them, but that he would take care that they should praise him. Then all the other soldiers crossed the river. It was said that this river had never before been passable on foot.

13–15 The Athenians being besieged both by land and by sea were at a loss to know what to do, because they had neither ships nor allies nor food. They thought that there was no hope that they would not suffer in the same way that they had made others suffer. When their food had entirely given out, they sent ambassadors to Sparta to make peace on this condition—that the walls of Athens should stand.

birth=**γένος**, turn round=**ἀντιστρέφω**, never before=**οὐπώποτε**, passable=**διαβατός**, be at a loss=**ἀπορέω**, entirely=**παντελῶς**, give out=**ἐπιλείπω**

High School Department

170TH EXAMINATION

LATIN—First Year

August 1901—Three hours, only

Answer 10 questions but* no more, *including at least one translation into English and one translation into Latin. If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.

1 Mark the division into syllables and the accent of *five* of the following: *militis*, *illius*, *equorum*, *poetae*, *urbibus*, *adestne*, *amabimus*, *rexerunt*.

2 Translate into English:

Id oppidum tam editum erat ut expugnari non *posse videretur*. Ante oppidum planities milia passuum *tria* in longitudinem patebat; reliquis ex *omnibus partibus* colles magnae altitudinis oppidum cingebant.

editus = elevated, *planities* = plain, *pateo* = extend, *cingo* = surround

3 Conjugate *posse* in the future indicative, in the perfect subjunctive; *videretur* in the perfect indicative passive, in the present subjunctive passive.

4 Decline, in the singular, *id oppidum*, *omnibus partibus*. Decline *tria* in the masculine.

5 Translate into Latin:

a This hill is higher than that.

b He came to lead the foot-soldiers.

c They were not able to return to Gaul.

d He says that Caesar is preparing an army.

e We must wage war with the Romans.

6 Write the second person singular of *each* of the tenses of the indicative and subjunctive passive of *capio*.

7 Translate into English:

Dareus, cum ex Europa in Asiam *redisset*, classem *paravit*, ut cum Atheniensibus bellum *gereret*. Ei *classi* duo duces praefecit, *iis*que ducenta peditum milia, decem *equitum* milia *dedit*. Inde ad Atticam *accesserunt* ac suas copias in campum *duxerunt*.

8 Give the reason for the case of *classi*, *iis*, *equitum;* for the mode of *redisset*, *gereret*.

9 Give the principal parts of *paravit*, *gereret*, *dedit*, *accesserunt*, *duxerunt*.

10 Decline *via longior*, *quidam puer*, in the singular; *audiens* in the masculine singular.

11 Translate into Latin:

a There were many soldiers in the town.
b Let us capture the fleet.
c He is about to lead his forces into Europe.
d Are the mountains of Asia high?
e If the horsemen were here, we should conquer.

12 Write all the infinitives and the present imperative, active and passive, of *amo*.

13 Translate into English:

Tres viatores a Gallia ad Italiam iter faciebant. Via et longa et difficillima erat quod undique montibus altissimis continebatur. Saepe cibi inopiam magnam viatores tolerabant; tandem nihil superat nisi unus panis, quem omnes diligentissime servabant.

viator=traveler, *cibus*=food, *tolero*=endure, *panis*=loaf of bread

14 From the Latin passage in question 13 select *a*) an ablative of means, *b*) an indeclinable noun, *c*) a predicate adjective, *d*) an accusative of limit of motion, *e*) an ablative of separation.

15 From the Latin passage in question 13 select and compare *a*) *three* adjectives, *b*) *two* adverbs.

High School Department

171ST EXAMINATION

LATIN—First Year

Tuesday, September 24, 1901—9.15 a. m. to 12.15 p. m., only

Answer 10 questions but **no more,** *including at least one translation into English and one translation into Latin. If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Indicate the gender of each of *four* of the following nouns, giving the rule in each case: *agricola*, *ventus*, *celeritas*, *nomen*, *Garumna* (Garonne river), *pes*, *equitatus*, *Aegyptus* (Egypt), *res*.

2 Decline *dominus*, *vulnus*, in the singular; *victor*, *pars*, *dies*, in the plural.

3 Translate into English:

Equites nostri, ut eos subito adoriri *possent*, celeriter ad eum locum venerunt. *Clamore* ab ea parte audito pedites nostri magna *virtute* oppugnare coeperunt. Hostes, cum *se* superatos *viderent*, fuga salutem petiverunt.

subito=suddenly, *adorior*=attack

4 Give the reason for the case of *clamore*, *virtute*, *se;* for the mode of *possent*, *viderent*.

5 Translate into Latin:

a They were able to see the flight of the cavalry.

b The enemy must be overcome.

c If our men come, they will storm the place.

d He says that he began to conquer on that day.

e The Romans are all men of great valor.

6 Write the second person plural of *each* of the tenses of the indicative and subjunctive of *fio*.

7 Translate into English:

Erant viae duae quibus imperator ex Asia cum suo exercitu domum redire posset. Earum viarum brevior erat per loca quae nemo incolebat propter aquae inopiam; altera via erat multo longior sed per agros omnium rerum abundantes.

abundans=well supplied

8 Decline *haec pulchra urbs* in the singular; *facilis* in the plural in all genders.

9 From the Latin passage in question 7, select *a*) an ablative of accompaniment, *b*) a partitive genitive, *c*) an ablative of means, *d*) an accusative of limit of motion, *e*) a predicate adjective.

10 Write the principal parts of *duco*, *convoco*, *sequor*, *sum*, *relinquo*.

11 Translate into Latin:

a Who inhabit these places that we see?
b Let us seek peace from the barbarians.
c Is not this man much taller than his brother?
d There was a scarcity of all things in our army.
e The road was so long that we returned.

12 Conjugate *iubeo* in the perfect indicative active, in the future indicative passive; *peto* in the pluperfect indicative active, in the pluperfect subjunctive passive.

13 Translate into English:

a Ubi ea dies venit, legati ad eum reverterunt.
b Caesar respondit se cum iis pacem facturum esse.
c Barbari castris Romanorum potiti sunt.
d Hic locus ab colle milia passuum sex aberat.
e Horum adventu hostes bellum acrius gesserunt.

14 Compare *sapiens*, *difficilis*, *multus*. Form an adverb from *a*) *bonus*, *b*) *prudens*. Compare *one* of the adverbs formed.

15 Decline *a*) the gerund of *moneo*, *b*) *altius oppidum* in the singular and plural.

High School Department

172D EXAMINATION

LATIN—First Year

Tuesday, January 28, 1902—9.15 a. m. to 12.15 p. m., only

Answer 10 questions but* no more, *including at least one translation into English and one translation into Latin. If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.

1 Mark the division into syllables and the accent of *five* of the following words: *patribus*, *causae*, *virtutis*, *amavistine*, *omnium*, *terrarum*, *rexerim*, *audiamur.*

2 Decline *civis*, *acies*, in the singular; *vir*, *nauta*, *tempus*, in the plural.

3 Translate into English:

Dum *haec* Romae *geruntur*, imperator cum eis militibus, quos a Caesare *acceperat*, in fines Gallorum venit. His *praeerat* Viridovix ac *imperium tenebat* earum *omnium civitatum* quae eo tempore defecerant. Ex his civitatibus Viridovix *exercitum* magnasque copias coegerat.

imperator = general, *Viridovix* = Viridovix, *deficio* = rebel, *cogo* = collect

4 Decline, in the singular, *imperium*, *omnium civitatum*, *exercitum*, the feminine of *haec.*

5 Conjugate *acceperat* in the future perfect indicative active, in the imperfect subjunctive passive; *tenebat* in the perfect indicative active, in the future indicative passive.

6 Translate into Latin:

a He says that he is a Roman general.

b He came to Rome to see the consul.

c Because their towns were fortified, the enemy did not fear.

d Let us go against the Gauls with our forces.

e Have you the sword that you captured?

7 **Write the second person singular of *each* of the tenses of the indicative and subjunctive of *possum.***

8 Translate into English:

Cum Dareus ad Atticam cum copiis *accessisset*, Athenienses nuntium *Spartam* miserunt ut auxilium *peteret*. Postea Athenienses copias ex urbe *eduxerunt* castraque fecerunt. Secundo *die* sub monte *acie* instructa, proelium cum hostibus commiserunt.

Dareus=Darius, *Attica*=Attica

9 Give the reason for the case of *Spartam*, *die*, *acie;* for the mode of *accessisset*, *peteret*.

10 Translate into Latin:

a He orders the soldiers to make war on the Greeks.
b They will not obey the leader of the army.
c We must send messengers to our friends.
d Prepare to lead the cavalry into the territories of the Gauls.
e I am about to rule in those provinces.

11 Compare *altus*, *magnus*, *miser*. Form an adverb from *facilis*. Form and compare an adverb from *gravis*.

12 Decline in the plural *a*) *ego*, *tu*, *sui*, *b*) *amans* in all genders.

13 Write the principal parts of *geruntur*, *praeerat*, *tenebat* (question 3), *peteret*, *eduxerunt* (question 8).

14 Translate into English:

Deinde ab eo loco progressus Ulixes ad insulam Aeoliam venit. Ibi rex ipse Graecos accepit atque eis persuasit ut paucos dies in ea insula manerent. Septimo die Ulixes ad Ithacam sine mora profectus est.

progredior=advance, *Ulixes*=Ulysses, *Aeolia*=Aeolia

15 State, with reason, the case that should be used in translating into Latin each italicized word in the following:

a The army marched six *miles*.
b Part of the *soldiers* retreated.
c He gave *me* a book.
d We praised Cicero, the *consul*.
e He struck me with a *javelin*.

High School Department

173D EXAMINATION

LATIN—First Year

Wednesday, March 26, 1902—9.15 a. m. to 12.15 p. m., only

Answer 10 questions but no more, *including at least one translation into English and one translation into Latin. If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Indicate the accent and the gender of *each* of the following nouns: ***gladiorum***, ***insulae***, ***montium***, ***capite***, ***noctibus***, ***laborem***, ***nihil***, ***periculis***, ***voluptatis***, ***frumento.***

2 Decline ***corpus***, ***magister***, ***adventus***, in the singular; ***silva***, ***eques***, in the plural.

3 Translate into English:

Hostes magnam classem contrahunt. Hos Conon adortus magno proelio fugat et multas naves *capit.* Qua victoria non solum Athenae, sed etiam omnis Graecia, quae sub imperio hostium fuerat, *liberata est.*

contraho=collect, *fugo*=put to flight, *Graecia*=Greece

4 Conjugate *capit* in the future indicative active, in the perfect subjunctive passive; *liberata est* in the future imperative active, in the present subjunctive passive.

5 Translate into Latin:

- *a* The soldiers aided the wretched inhabitants.
- *b* They will hasten to the city of Athens.
- *c* He was overcome by a man larger than he.
- *d* Since you are here, let us set out.
- *e* The wall was destroyed by the foot-soldiers.

6 Decline, in the plural, ***ingens proelium***, ***iter difficile***, the feminine of ***paucus.***

7 Write the principal parts of ***exeo***, ***recipio***, ***utor***, ***scio***, ***habeo.***

8 Translate into English:

Cum celerrime ad fines ***eorum venisset***, Remi, qui proximi ***Galliae*** sunt, ad eum legatos, primos civitatis, miserunt, qui ***dicerent*** se in potestatem populi Romani ***permittere.*** Hoc ab his factum est.

Remi=Remi, ***potestas***=power, ***permitto***=surrender

9 Give the reason for the case of *eorum*, *Galliae;* for the mode of *venisset*, *dicerent*, *permittere*.

10 Translate into Latin:

a These ambassadors were from that state.

b If we shall give everything to the Romans, we shall not be able to do this.

c Go before he comes.

d On the fifth day our army got possession of this town.

e He says that he will send hostages.

11 Write the second person singular of *each* of the tenses of the indicative active of *fero;* the third person plural of *each* of the tenses of the subjunctive passive of *fero*.

12 Translate into English:

a Oppidum aberat milia passuum octo.

b Consilio convocato domum suam reverterunt.

c Caesari omnia uno tempore erant agenda.

d Hic, cum fratri auxilium ferret, interfectus est.

e Ita eos terruimus ut naves peterent.

13 Compare *brevis*, *acer*, *malus*. Form an adverb from the positive of *acer;* from the positive, the comparative and the superlative of *malus*.

14 Decline, in singular and plural, the masculine of *ille*, the neuter of *quis;* in the plural, the neuter of *is*.

15 From the Latin sentences in question 12, select an ablative absolute, a dative of agent, a dative of the indirect object, an accusative of extent of space, an accusative of limit (end) of motion.

High School Department

174TH EXAMINATION

LATIN—First Year

Tuesday, June 17, 1902—9.15 a. m. to 12.15 p. m., only

Answer 10 questions but **no more,** *including at least one translation into English and one translation into Latin. If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 State *three* rules for the accent of words. Illustrate each rule by a Latin word, indicating the accent of each word given.

2 Decline *domus*, *spes*, in the singular; *homo*, *equus*, *navis*, in the plural.

3 Translate into English:

Eo tempore equitatus totius Galliae magna *celeritate* convenit, *numero* milia quattuor, principesque ex omnibus civitatibus. *Eorum* paucos relinquere in Gallia, reliquos secum *ducere* decreverat, quod, cum ipse *abesset*, motum Galliae timebat.

reliqui=the rest, *decerno*=decide, *motus*=uprising

4 Give the reason for the case of *celeritate*, *numero*, *eorum;* for the mode of *ducere*, *abesset*.

5 Translate into Latin:

a A great number of them assembled when the chiefs were away.

b We are afraid because so few of us are left.

c The cavalry will be led by Caesar.

d Bring that javelin quickly.

e They are about to go.

6 Write the principal parts of *video*, *appello*, *interficio*, *conor*, *defendo*.

7 Decline *iste* in the singular, in all genders; *duo* in all genders.

8 Translate into English:

Ex ea insula Hannibal in Bithyniam venit. Romani se numquam futuros esse tutos existimabant cum Hannibal viveret. Itaque legatos miserunt qui eum ab rege Bithynorum peterent. Rex non negavit ibi Hannibalem esse.

tutus=safe, *existimo*=think, *nego*=deny

9 Conjugate ***nolo*** in the present indicative, the perfect indicative, the imperfect subjunctive, the present imperative.

10 Compare ***amans***, ***pulcher***, ***facilis***, ***parvus***. Form an adverb from ***brevis***, ***altus***.

11 Decline the following in the plural: ***vir fortis***, ***agricola aeger***, the neuter of ***alius***.

12 Translate into Latin:

a We hear that the camp is fortified.
b He had lived for many years at Rome.
c The horseman was wounded with a sword.
d The mountain was so high that the army did not proceed.
e We must set out.

13 Write the active and passive infinitives and the active and passive participles (including gerundive) of ***dico*** (say).

14 Translate into English:

a Postquam venerat, in proelio occisus est.
b Hac pugna pugnata, Romam profectus est.
c Barbari commoti quod oppidum expugnatum erat, copias parare coeperunt.
d Postea equitatui omni praefuit.
e Ad eum locum capiendum Caesar equites misit.

15 Define and illustrate by a Latin word ***enclitic***, ***intransitive verb***, ***demonstrative pronoun***, ***ordinal numeral***, ***interrogative pronoun***.

High School Department

171ST EXAMINATION

CAESAR'S COMMENTARIES

Thursday, September 26, 1901 — 9.15 a. m. to 12.15 p. m., only

---

Answer the first six questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1-5 Translate into English:

a EFFECT OF CAESAR'S SPEECH

Hac oratione habita mirum in modum conversae sunt omnium mentes, summaque alacritas et *cupiditas* belli gerendi innata est; *princeps*que decima legio per tribunos militum ei gratias egit quod de se *optimum* iudicium *fecisset*, seque esse ad bellum *gerendum* paratissimam confirmavit. Deinde reliquae legiones cum tribunis militum et *primorum ordinum* centurionibus egerunt uti *Caesari satisfacerent: se nec* umquam dubitasse neque timuisse, neque de summa belli suum iudicium sed *imperatoris* esse *existimavisse.*

b CAESAR PREPARES TO MOVE AGAINST THE BELGIANS

His nuntiis *litteris*que *commotus* Caesar duas legiones in citeriore Gallia novas conscripsit, et inita aestate in interiorem Galliam qui deduceret Q. Pedium legatum misit. Ipse cum primum pabuli copia *esse inciperet* ad *exercitum* venit; dat *negotium* Senonibus reliquisque Gallis, qui finitimi *Belgis* erant, uti ea quae apud eos gerantur *cognoscant* seque de his *rebus certiorem* faciant. Hi constanter omnes nuntiaverunt *manus cogi*, exercitum in unum locum conduci. Tum vero dubitandum non existimavit quin ad eos *proficisceretur.*

c SUBMISSION OF THE MORINI

Dum in his locis Caesar navium parandarum causa *moratur*, ex magna parte *Morinorum* ad eum legati venerunt, qui se de superioris temporis *consilio* excusarent, quod *homines* barbari et nostrae *consuetudinis* imperiti bellum populo Romano fecissent, seque ea quae *imperasset* facturos *pollicerentur.* Hoc sibi Caesar satis *opportune accidisse* arbitratus, quod neque post tergum hostem *relinquere volebat* neque belli gerendi propter anni tempus facultatem habebat neque has tantularum rerum occupationes Britanniae *anteponendas* iudicabat, magnum iis numerum obsidum imperat.

6 Translate into Latin [Do not use rare or poetic constructions]:

a He says that the tenth legion will wage war with the enemy.

b Caesar wishes to ascertain what the Gauls are doing.

c He must lead the army into the territories of the Belgians.

7 Translate into Latin [Do not use rare or poetic constructions]:

a While the Romans were preparing their ships, the envoys of the barbarians came.

b Who will come to command the forces that were enrolled in the summer?

c Will they not promise to do these things?

8 Give the reason for the case of ***oratione***, ***imperatoris*** (*a*), ***litteris***, ***Belgis*** (*b*), ***Morinorum*** (*c*); for the mode of ***fecisset*** (*a*), ***esse***, ***proficisceretur*** (*b*), ***moratur***, ***imperasset*** (*c*).

9 Write the principal parts of ***gerendum*** (*a*), ***cognoscant***, ***cogi*** (*b*), ***pollicerentur***, ***volebat*** (*c*).

10 Describe the weapons and armor of a Roman legionary soldier.

11 Decline, in singular and plural, ***ordinum*** (*a*), ***rebus*** (*b*), ***consilio*** (*c*), ***hac*** (*a*) in the feminine gender, ***certiorem*** (*b*) in the masculine gender.

12 Give the reason for the case of *Caesari* (*a*), ***manus*** (*b*), ***homines***, ***consuetudinis*** (*c*); for the mode of ***satisfacerent*** (*a*), ***inciperet*** (*b*). Compare ***primorum*** (*a*), ***opportune*** (*c*).

13 Write in direct discourse ***se nec . . . existimavisse*** (*a*).

14 Illustrate by original Latin sentences *a*) objective genitive, *b*) ablative of agent, *c*) comparative degree without ***quam***, *d*) dative of purpose or end, *e*) clause of negative purpose.

15 Give the derivation or composition of ***cupiditas***, ***princeps*** (*a*), ***exercitum***, ***cogi*** (*b*), ***anteponendas*** (*c*). Give an English word containing the stem of ***optimum*** (*a*), ***commotus***, ***negotium*** (*b*), ***accidisse***, ***relinquere*** (*c*)

High School Department

172D EXAMINATION

CAESAR'S COMMENTARIES

Tuesday, January 28, 1902 — 1.15 to 4.15 p. m., only

Answer the first six questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–5 Translate into English:

a THE BELGIANS TRY TO CROSS THE AXONA

Hostes protinus ex eo loco ad flumen Axonam contenderunt, quod esse post nostra castra *demonstratum est.* Ibi vadis repertis partem suarum copiarum transducere conati sunt, *eo consilio* ut, si *possent*, castellum cui *praeerat* Q. Titurius *legatus* expugnarent pontemque interscinderent: si *minus* potuissent, *agros Remorum* popularentur, qui magno nobis *usui* ad bellum gerendum erant, *commeatu*que nostros *prohiberent.* — 2, 9

b THE ARRIVAL OF CAESAR'S FLEET

Compluribus *expugnatis oppidis* Caesar, ubi intellexit frustra tantum laborem *sumi* neque hostium *fugam captis* oppidis reprimi neque his *noceri* posse, statuit exspectandam classem. Quae ubi *convenit* ac primum ab hostibus visa est, circiter ducentae et viginti naves eorum paratissimae atque *omni genere* armorum ornatissimae profectae ex portu *nostris* adversae constiterunt; neque satis Bruto qui *classi* praeerat, vel *tribunis militum centurionibus*que quibus singulae naves erant attributae, constabat quid *agerent* aut quam rationem pugnae insisterent. — 3, 14

c CAESAR AGREES TO A CESSATION OF HOSTILITIES

Haec omnia Caesar eodem illo pertinere arbitrabatur, ut *tridui* mora interposita equites eorum qui abessent reverterentur: tamen sese non longius *milibus passuum* quattuor aquationis causa processurum eo *die* dixit: huc postero die quam frequentissimi convenirent, ut de eorum postulatis *cognosceret.* Interim ad praefectos, qui cum omni *equitatu* antecesserant, *mittit* qui *nuntiarent*, ne hostes proelio lacesserent, et si ipsi lacesserentur, *sustinerent* quoad ipse cum exercitu *propius accessisset.* — 4, 11

6 Translate into Latin [Do not use rare or poetic constructions]:

a Caesar is about to lead his army from this city into the country of the Belgians.

b Brutus thinks that the ships of the enemy are not able to injure his fleet.

c Are the centurions ready for the battle?

7 Translate into Latin [Do not use rare or poetic constructions]:

a Caesar did not ascertain why the Remi had led all their cavalry across the river.

b He sent the horsemen that Titurius commanded, to capture the town nearest to our camp.

8 Give the reason for the case of *Remorum*, *usui* (*a*), *oppidis*, *classi* (*b*), *milibus* (*c*); for the mode of *possent* (*a*), *sumi*, *agerent* (*b*), *nuntiarent*, *accessisset* (*c*).

9 Decline, in the plural, *eo consilio* (*a*), *omni genere*, *classi* (*b*), *equitatu* (*c*). Compare *minus* (*a*), *propius* (*c*).

10 Write the following in direct discourse:

Tamen sese non longius milibus passuum quattuor aquationis causa processurum eo die: huc postero die quam frequentissimi convenirent, ut de eorum postulatis cognosceret (*c*).

11 Give the reason for the case of *commeatu* (*a*), *fugam*, *genere*, *nostris* (*b*), *passuum*, *die* (*c*). Select from 1–5 *two* substantive clauses, giving the syntax of each clause selected.

12 Write the principal parts of *demonstratum est*, *prohiberent* (*a*), *noceri*, *convenit* (*b*), *cognosceret* (*c*).

13 State the important duties of *each* of the following: *legatus* (*a*), *tribunis militum*, *centurionibus* (*b*).

14 Write the second person singular of *each* of the tenses of the indicative and subjunctive, active and passive, of *mittit* (*c*).

15 Give the composition of *each* of the following and show how the meaning of each is derived: *praeerat* (*a*), *tridui*, *sustinerent* (*c*). Mention an English word containing the stem of *agros* (*a*), *fugam*, *genere* (*b*), *mittit* (*c*).

High School Department

173D EXAMINATION

CAESAR'S COMMENTARIES

Wednesday, March 26, 1902—1.15 to 4.15 p. m., only

Answer the first six questions and four of the others but **no more**. *If more than four of the others are answered only the first four answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–5 Translate into English:

a DIVITIACUS OBTAINS HIS BROTHER'S PARDON

Haec cum *pluribus verbis* flens a Caesare *peteret*, Caesar eius dextram prendit; consolatus rogat finem *orandi* faciat; *tanti* eius apud se gratiam esse ostendit uti et *rei publicae* iniuriam et suum dolorem eius voluntati ac precibus *condonet*. Dumnorigem ad se vocat, *fratrem* adhibet; quae in eo reprehendat ostendit, quae ipse *intellegat*, quae civitas queratur, *proponit;* monet ut in reliquum tempus omnes suspiciones *vitet;* praeterita *se* Divitiaco fratri condonare dicit.—1, 20

b CRASSUS IN AQUITANIA

Eodem fere *tempore* P. Crassus, cum in Aquitaniam *pervenisset*, quae pars, ut ante dictum est, et *regionum* latitudine et *multitudine* hominum ex tertia parte Galliae est aestimanda, cum intellegeret in iis locis *sibi* bellum gerendum, ubi paucis ante *annis* L. Valerius Praeconinus *legatus* exercitu *pulso interfectus esset*, atque unde L. Manilius proconsul impedimentis amissis profugisset, non *mediocrem* sibi *diligentiam* adhibendam intellegebat.—3, 20

c CAESAR SUBDUES THE MORINI

Interim nostri milites impetum *hostium sustinuerunt* atque amplius *horis* quattuor fortissime pugnaverunt et paucis vulneribus acceptis complures ex his *occiderunt*. Postea vero quam equitatus noster in conspectum *venit*, hostes abiectis armis terga verterunt magnusque *eorum* numerus est occisus.

Caesar postero die T. Labienum *legatum* cum *iis legionibus* quas ex Britannia reduxerat in Morinos qui rebellionem fecerant misit. Qui cum propter siccitates paludum quo se reciperent non *haberent*, quo *perfugio superiore anno* erant usi, omnes fere in potestatem Labieni pervenerunt.—4, 37–38

6 Translate into Latin [Do not use rare or poetic constructions]:

a Caesar ordered them to summon Dumnorix.

b He said that we must wage war. Let us wage it with the greatest diligence.

c Our horsemen fight so bravely that the army of the enemy is not able to withstand their attack.

7 Translate into Latin [Do not use rare or poetic constructions]:

a Shall we not censure this man?

b He knew that the army had been defeated and the baggage lost.

c After a few of the Morini had been killed by our cavalry, the rest retreated.

8 Give the reason for the case of ***tanti*** (*a*), ***sibi*** (*b*, line 4), ***annis*** (*b*), ***eorum***, ***legatum*** (*c*); for the mode of ***condonet***, ***intellegat***, ***vitet*** (*a*), ***interfectus esset*** (*b*), ***haberent*** (*c*).

9 Write the principal parts of ***peteret***, ***intellegat*** (*a*), ***pulso*** (*b*), ***sustinuerunt***, ***venit*** (*c*).

10 Give the reason for the case of ***rei publicae*** (*a*), ***se*** (*a*, line 8), ***regionum***, ***multitudine*** (*b*), ***horis***, ***perfugio*** (*c*). Compare ***pluribus*** (*a*), ***superiore*** (*c*).

11 Write in direct discourse:

Tanti eius apud se gratiam esse uti et rei publicae iniuriam et suum dolorem eius voluntati ac precibus condonet (*a*).

12 Write an account of the siege operations employed by the Romans in capturing a fortified town.

13 Decline, in the singular, ***se*** (*a*), ***eodem tempore***, ***mediocrem diligentiam*** (*b*), ***iis legionibus***, ***superiore anno*** (*c*). Decline ***orandi*** (*a*).

14 Illustrate by original Latin sentences (*a*) active (first) periphrastic conjugation, (*b*) ablative of separation, (*c*) dative depending on an adjective, (*d*) genitive depending on an adjective, (*e*) infinitive used as subject.

15 Give, with meaning of prefix and stem, the composition of ***proponit*** (*a*), ***pervenisset*** (*b*), ***occiderunt*** (*c*). Give an English word containing the stem of ***verbis***, ***fratrem*** (*a*), ***legatus*** (*b*), ***hostium*** (*c*).

High School Department

174TH EXAMINATION

CAESAR'S COMMENTARIES

Tuesday, June 17, 1902 — 1.15 to 4.15 p. m., only

Answer the first six questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–5 Translate into English:

a THE ESCAPE FROM TRIAL AND THE DEATH OF ORGETORIX

Die constituta *causae dictionis* Orgetorix ad *iudicium* omnem suam familiam ad *hominum* milia decem undique coegit, et omnes clientes obaeratosque suos, quorum magnum numerum *habebat*, eodem conduxit: per eos ne causam *diceret* se *eripuit*. Cum civitas ob eam rem incitata *armis ius suum exsequi conaretur*, multitudinemque hominum ex *agris* magistratus cogerent, Orgetorix mortuus est; neque abest suspicio, ut Helvetii arbitrantur, quin ipse *sibi* mortem *consciverit*.—1, 4

b AID SENT TO CAESAR BY LABIENUS

Interim milites legionum duarum, quae in *novissimo agmine* praesidio impedimentis fuerant, *proelio* nuntiato cursu incitato in *summo colle* ab hostibus conspiciebantur; et T. Labienus castris *hostium* potitus et ex loco superiore quae res in nostris castris *gererentur* conspicatus decimam legionem *subsidio* nostris misit. Qui cum ex equitum et calonum fuga, quo in loco res esset, quantoque in periculo et castra et legiones et *imperator versaretur* cognovissent, nihil ad celeritatem sibi reliqui *fecerunt*.—2, 26

c PLANS FOR DISEMBARKING

Monuit, ut rei *militaris ratio*, maxime ut maritimae res *postularent*, ut cum *celerem* atque *instabilem motum haberent*, ad nutum et ad tempus omnes res ab iis administrarentur. His dimissis et ventum et aestum uno *tempore nactus* secundum, dato signo et sublatis ancoris, circiter milia passuum septem ab eo loco progressus *aperto* ac plano *litore* naves *constituit*.—4, 23

6 Translate into Latin [Do not use rare or poetic constructions]:

a Orgetorix brought together his retainers from all sides so that it was impossible for the state to enforce the law.

b Labienus had to get possession of that part of the hill not abandoned by the enemy.

7 Translate into Latin [Do not use rare or poetic constructions]:

a He has sent a great number of soldiers to collect ships from the shore.

b The soldiers say that Caesar is about to go forward seven miles with the ships that he has.

8 Give the reason for the case of *hominum* (*a*, line 2), *armis* (2), *proelio*, *subsidio* (*b*), *tempore*, *litore* (*c*); for the mode of *diceret*, *conaretur* (*a*), *gererentur* (*b*), *haberent* (*c*).

9 Decline, in the singular, *ius suum*, *agris* (*a*), *instabilem motum* (*c*); in the plural, *novissimo agmine*, *summo colle* (*b*), *ratio* (*c*).

10 Write on *one* of the following: (*a*) the war with Ariovistus, (*b*) Caesar's first expedition into Britain, (*c*) the dress, religion and government of the Gauls.

11 Translate into English: Ariovistus respondit: *non sese* Gallis, sed Gallos sibi bellum intulisse; omnes Galliae civitates ad se oppugnandum *venisse*.

Rewrite *non sese* . . . *venisse* in direct discourse.

12 Give the reason for the case of *causae*, *sibi* (*a*), *hostium* (*b*); for the mode of *exsequi*, *consciverit* (*a*), *postularent* (*c*); for the number of *versaretur* (*b*). Select from questions 1–5 an ablative of agent, an ablative of separation, an indeclinable noun.

13 Write the principal parts of *eripuit* (*a*), *fecerunt* (*b*), *haberent*, *nactus*, *constituit* (*c*).

14 Compare *summo* (*b*), *celerem*, *aperto* (*c*). Give the rule for the gender of *die* (*a*). Give the force of the tense of *habebat* (*a*).

15 Give the derivation of *each* of the following, stating the meaning of stem and of suffix: *agmine*, *imperator* (*b*), *militaris* (*c*). Mention an English word containing the stem of *dictionis*, *iudicium* (*a*), *monuit*, *constituit* (*c*).

University of the State of New York

High School Department

172D EXAMINATION

SALLUST'S CATILINE

Thursday, January 30, 1902—9.15 a. m. to 12.15 p. m., only

Answer the first six questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–5 Translate into English:

a THE DIFFICULTIES OF THE HISTORIAN

Pulchrum est bene *facere* rei publicae, etiam bene dicere haud *absurdum* est; vel pace vel bello clarum fieri licet; et qui fecere, et qui facta *aliorum* scripsere, multi laudantur. Ac mihi quidem, tametsi haudquaquam par gloria *sequitur* scriptorem et actorem rerum, tamen in primis arduum videtur res gestas *scribere;* primum quod facta *dictis* exaequanda sunt; dehinc quia plerique, quae delicta *reprehenderis*, *malevolentia* et *invidia* dicta putant.—3

b CICERO TO BE BLAMED FOR THE WAR

At *Romae* Lentulus cum ceteris, qui principes coniurationis erant, paratis ut videbantur magnis copiis, *constituerant*, uti, cum Catilina in *agrum* Faesulanum cum exercitu *venisset*, L. Bestia tribunus *plebis contione* habita quereretur de actionibus Ciceronis, bellique gravissimi invidiam *optimo consuli imponeret;* eo signo proxima *nocte* cetera multitudo coniurationis suum *quisque* negotium exsequeretur.—43

c CATILINE'S ADDRESS TO HIS FOLLOWERS

Si haec *relinquere vultis*, *audacia* opus est; nemo nisi victor pace bellum mutavit. Nam in fuga *salutem* sperare, cum arma, quibus *corpus* tegitur, ab hostibus averteris, ea vero *dementia* est. Semper in proelio iis maximum est periculum, qui *maxime* timent; audacia pro muro habetur. Cum vos considero, milites, et cum facta vestra aestimo, magna me spes *victoriae* tenet. Animus, aetas, *virtus vestra* me hortantur, praeterea necessitudo, quae etiam timidos *fortis* facit: nam multitudo hostium ne circumvenire *queat* prohibent angustiae loci.—58

6 Translate into Latin [Do not use rare or poetic constructions]:

a There is no one in this assembly who does not hope for peace.

b The tribune led his soldiers back into camp in order that he might not be surrounded by the enemy.

c Would that Lentulus had left the city with Catiline.

7 Translate into Latin [Do not use rare or poetic constructions]:

a If I could, I would praise the deeds of this famous man.

b Consider, citizens, how great a conspiracy has been made against this republic.

c Catiline hoped to come to his army on the 8th of November.

8 Give the reason for the case of ***absurdum, dictis, malevolentia*** (*a*), ***consuli*** (*b*), ***audacia*** (*c*, line 1), ***victoriae*** (*c*); for the mode of ***facere, reprehenderis*** (*a*), ***venisset*** (*b*), ***queat*** (*c*).

9 Write the principal parts of ***sequitur, scribere*** (*a*), ***constituerant, imponeret*** (*b*), ***relinquere*** (*c*).

10 Write on *two* of the following: *a*) the part played by Cicero in the suppression of Catiline's conspiracy, *b*) Sallust as a historian, *c*) Sallust's literary style.

11 Decline throughout ***agrum*** (*b*), ***corpus, virtus vestra*** (*c*), ***quisque*** (*b*) in the masculine gender.

12 Give the reason for the case of ***aliorum*** (*a*), ***Romae, contione, nocte*** (*b*). Compare ***pulchrum*** (*a*), ***optimo*** (*b*), ***maxime*** (*c*).

13 Write the second person singular of ***each*** of the tenses of the indicative and subjunctive of ***sequitur*** (*a*), ***vultis*** (*c*).

14 Give the composition of ***each*** of the following and show how the meaning of each is derived: ***malevolentia, invidia*** (*a*), ***dementia*** (*c*). Give an English word containing the stem of ***dictis*** (*a*), ***plebis*** (*b*), ***salutem, fortis*** (*c*).

15 Translate into English:

Est in carcere locus quod Tullianum appellatur, ubi paululum ascenderis ad laevam, circiter duodecim pedes humi depressus. Eum muniunt undique parietes atque insuper camera lapideis fornicibus iuncta, sed incultu, tenebris, odore, foeda atque terribilis eius facies est.—55

University of the State of New York

High School Department

174TH EXAMINATION

SALLUST'S CATILINE

Thursday, June 19, 1902—9.15 a. m. to 12.15 p. m., only

Answer the first six questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1-5 Translate into English:

a CATILINE'S PROMISES TO HIS ASSOCIATES

Postquam accepere ea homines, quibus mala abunde omnia erant, sed neque res neque spes bona ulla, tametsi *illis* quieta *movere* magna *merces* videbatur, tamen postulavere plerique, uti *proponeret* quae condicio belli foret, quae praemia armis *peterent*, quid ubique opis aut *spei* haberent. Tum Catilina *polliceri* tabulas *novas*, *proscriptionem locupletium*, *magistratus*, sacerdotia, rapinas, alia omnia, quae bellum atque lubido victorum *fert.*—21

b UMBRENUS TAMPERS WITH THE ALLOBROGES

Igitur P. *Umbreno cuidam negotium* dat, uti legatos Allobrogum *requirat*, eosque si *possit impellat* ad societatem belli, existumans publice privatimque aere alieno oppressos, praeterea quod *natura gens Gallica* bellicosa esset, facile eos ad tale consilium *adduci posse.* Umbrenus, quod in Gallia negotiatus erat, *plerisque principibus* civitatium notus erat atque eos noverat; itaque sine mora, ubi *primum* legatos in foro *conspexit*, percontatus pauca de statu civitatis et quasi dolens eius casum requirere coepit, quem exitum tantis *malis sperarent.* —40

c CATO SETS FORTH THE PERILS OF THE SITUATION

Nam quid ego de Gabinio, Statilio, Caepario *loquar? Quibus* si quicquam umquam *pensi fuisset*, non ea consilia de re publica habuissent. Postremo, patres conscripti, si mehercule peccato locus esset, facile paterer *vos* ipsa *re* corrigi, quoniam *verba* contemnitis; sed undique circumventi sumus. Catilina cum exercitu faucibus urguet, alii intra moenia atque in sinu *urbis* sunt *hostes*, neque parari neque consuli quicquam occulte potest; quo magis properandum est.—52

6 Translate into Latin [Do not use rare or poetic constructions]:

(*a*) If we should surround the Allobroges in this place, they would be unable to disturb the peace, (*b*) Catiline promised the men so much recompense, that they were easily induced to join the war.

7 Translate into Latin [Do not use rare or poetic constructions]:

(*a*) Would that everything had been prepared, (*b*) What do you think will be the outcome of such a condition of the state? (*c*) Do not give evil advice to men who are oppressed by debt.

8 Give the reason for the case of *illis*, *merces* (*a*), *malis* (*b*), *pensi*, *urbis* (*c*); for the mode of *movere*, *proponeret* (*a*), *posse*, *sperarent* (*b*), *loquar* (*c*).

9 Write the principal parts of *movere*, *peterent* (*a*), *requirat*, *conspexit* (*b*), *loquar* (*c*).

10 Decline the following in the singular: *spei*, *magistratus* (*a*), *Umbreno cuidam* (*b*), *verba* (*c*); the following in the plural: *gens Gallica*, *plerisque principibus* (*b*), *urbis* (*c*).

11 Give the reason for the case of *locupletium* (*a*), *natura* (*b*), *quibus*, *vos* (*c*), *re* (*c*, line 4); for the mode of *polliceri* (*a*), *possit*, *adduci* (*b*), *fuisset* (*c*). Compare *primum* (*b*).

12 Write the second person singular and the first person plural of *each* of the tenses of the indicative and subjunctive active of *impellat* (*b*).

13 Write on *two* of the following: politics in Rome at the time of Catiline's conspiracy, the attitude of Cato in respect to the punishment of the conspirators, the fate of each of the leaders of the conspiracy.

14 Give the derivation or composition of *each* of the following and show how the meaning of each is derived: *proscriptionem* (*a*), *negotium*, *principibus* (*b*). Mention an English word containing the stem of *novas*, *fert* (*a*), *malis* (*b*), *hostes* (*c*).

15 Translate into English:

Multi autem, qui de castris visundi aut spoliandi gratia processerant, volventes hostilia cadavera, amicum alii, pars hospitem aut cognatum rĕperiebant; fuere item qui inimicos suos cognoscerent. Ita varie per omnem exercitum laetitia, maeror, luctus atque gaudia agitabantur.—61

University of the State of New York

High School Department

172D EXAMINATION

CICERO'S ORATIONS

Friday, January 31, 1902—9.15 a. m. to 12.15 p. m., only

Answer the first six questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–5 Translate into English:

a CATILINE WAS THE ASSOCIATE OF SCOUNDRELS

Nunc *vero* quam *subito* non solum ex urbe, verum etiam ex agris ingentem numerum perditorum hominum collegerat! Nemo non modo *Romae*, sed ne *ullo* quidem in angulo totius Italiae oppressus *aere alieno* fuit quem non ad hoc incredibile *sceleris* foedus asciverit. *Atque* ut *eius* diversa studia in *dissimili ratione perspicere possitis*, nemo est in *ludo* gladiatorio paulo ad *facinus audacior* qui se non *intimum* Catilinae esse *fateatur*, nemo in scaena levior et nequior qui *se* non eiusdem prope *sodalem* fuisse commemoret.—In Catilinam, 2, 4–5

b THE LOYALTY OF THE ROMAN KNIGHTS

Quid ego hic equites Romanos *commemorem?* qui vobis ita summam ordinis consiliique concedunt, ut vobiscum de amore *rei publicae certent:* quos ex multorum *annorum* dissensione huius ordinis ad societatem concordiamque *revocatos* hodiernus dies vobiscum atque haec causa coniungit: quam si coniunctionem, in consulatu confirmatam meo, perpetuam in re publica tenuerimus, confirmo vobis nullum posthac malum civile ac domesticum ad ullam rei publicae partem esse venturum.

—In Catilinam, 4, 7

c GREAT ARTISTS ARE WORTHY OF ADMIRATION

Quod si ipsi haec neque attingere neque *sensu* nostro gustare *possemus*, tamen ea mirari deberemus, etiam cum in aliis videremus. *Quis nostrum* tam *animo* agresti ac *duro* fuit, ut Roscii morte nuper non commoveretur? qui cum *esset senex mortuus*, tamen propter excellentem artem ac venustatem *videbatur* omnino mori non debuisse. Ergo ille corporis motu tantum amorem sibi conciliarat a nobis omnibus: *nos animorum* incredibiles motus celeritatemque ingeniorum *neglegemus?*

—Pro Archia poeta, 7–8

6 Translate into Latin [Do not use rare or poetic constructions]:

a) If the senate should join with the Roman knights against these desperate men, no harm would come to us, *b*) Do not neglect to mention the great love of all good citizens for the state.

7 Translate into Latin [Do not use rare or poetic constructions]:

a) I do not know whether the associates of Catiline will confess their crimes or not, *b*) There is no one in all Italy who does not admire Archias on account of his great talents.

8 Give the reason for the case of *aere*, *eius* (*a*), *se* (*a*, line 8), *rei publicae* (*b*, line 3), *nostrum* (*c*); for the mode of *possitis*, *fateatur* (*a*), *commemorem*, *certent* (*b*), *esset mortuus* (*c*).

9 Decline *dissimili ratione* (*a*), *senex* (*c*), throughout; *aere alieno* (*a*), *sensu* (*c*), in the singular; *quis* (*c*) in the masculine singular.

10 Write the principal parts of *revocatos* (*b*), *neglegemus* (*c*). Write the second person singular of *each* of the tenses of the subjunctive and imperative, active and passive, of *videbatur* (*c*).

11 Give the reason for the case of *Romae*, *intimum* (*a*), *annorum* (*b*), *animo* (*c*); for the mode and tense of *possemus* (*c*). Compare *dissimili*, *audacior* (*a*).

12 State the occasion and the object of the second oration against Catiline. Give a brief outline of this oration.

13 Distinguish in meaning *sceleris* and *facinus* (*a*), *intimum* and *sodalem* (*a*) Account for the position of *vero*, *ullo* (*a*). Explain the force of *atque* (*a*). Mention and define the figure in *nos animorum . . . neglegemus* (*c*).

14 Give the composition of *each* of the following and show how the meaning of each is derived: *subito*, *perspicere* (*a*), *neglegemus* (*c*). Give an English word containing the stem of *alieno*, *ludo* (*a*), *annorum* (*b*), *duro* (*c*).

15 Translate into English:

Sic Mithridates fugiens maximam vim auri atque argenti pulcherrimarumque rerum omnium, quas et a maioribus acceperat et ipse bello superiore ex tota Asia direptas in suum regnum congesserat, in Ponto omnem reliquit. Haec dum nostri colligunt omnia diligentius, rex ipse e manibus effugit.

—Pro lege Manilia 9

High School Department

173D EXAMINATION

CICERO'S ORATIONS

Wednesday, March 26, 1902—9.15 a. m. to 12.15 p. m., only

Answer the first six questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–5 Translate into English:

a CICERO ORDERS CATILINE TO DEPART

Refer, inquis, ad senatum: id enim postulas et, *si hic ordo sibi* placere *decreverit* te ire in exsilium, obtemperaturum *te esse* dicis. Non *referam*, id quod abhorret a meis *moribus*, et tamen faciam ut *intellegas* quid hi de te *sentiant*. Egredere ex urbe, Catilina, *libera* rem publicam *metu*, in exsilium, si hanc vocem exspectas, proficiscere. Quid est, Catilina? ecquid attendis? ecquid *animadvertis* horum silentium? Patiuntur, tacent. Quid exspectas auctoritatem loquentium, quorum voluntatem tacitorum perspicis?— In Catilinam, 1, 8

b CICERO RELIES ON THE CITIZENS FOR PROTECTION

Sed quoniam earum rerum, quas *ego* gessi, non eadem est fortuna atque condicio quae illorum, qui externa bella gesserunt, quod *mihi* cum iis vivendum est, quos *vici* ac *subegi*, *isti* hostes aut *interfectos* aut oppressos reliquerunt, *vestrum* est, Quirites, si *ceteris* facta sua recte prosunt, mihi mea ne quando obsint *providere*. Mentes enim hominum audacissimorum *sceleratae* ac *nefariae* ne vobis *nocere* possent ego providi: ne mihi *noceant* vestrum est providere.— In Catilinam, 3, 12

c MAGNITUDE OF THE WAR

Requiretur fortasse nunc quem ad modum, cum haec ita *sint*, reliquum possit *magnum* esse bellum. *Cognoscite*, Quirites: non enim hoc sine causa quaeri videtur. *Primum* ex suo regno sic Mithridates profugit, ut ex eodem Ponto Medea *illa* quondam profugisse dicitur, *quam praedicant* in fuga *fratris* sui membra in iis *locis*, qua se *parens persequeretur*, dissipavisse, ut *eorum* collectio dispersa maerorque patrius celeritatem *persequendi* retardaret.— Pro Lege Manilia, 9

6 Translate into Latin [Do not use rare or poetic constructions]:

a Do you know whether he has departed from Rome or not?

b Do not permit Catiline to harm this state.

c After Medea had killed her brother, she fled in great haste.

7 Translate into Latin [Do not use rare or poetic constructions]:

a If he should go out from the city, it would be advantageous to us.

b Would that Cicero had not done this.

c Pompey is about to carry on a foreign war.

8 Give the reason for the case of ***sibi*** (*a*), ***mihi*** (*b*, line 3), ***interfectos***, ***ceteris*** (*b*), *quam* (*c*); for the mode of ***sentiant*** (*a*), ***nocere***, ***noceant*** (*b*), ***sint***, ***persequeretur*** (*c*).

9 Write the principal parts of ***referam***, ***libera*** (*a*), ***vici***, ***providere*** (*b*), ***cognoscite*** (*c*).

10 Give the reason for the case of *metu* (*a*), *vestrum* (*b*, line 4), *fratris*, *eorum* (*c*); for the mode of ***intellegas*** (*a*), ***providere*** (*b*, line 6). Compare *magnum*, *primum* (*c*).

11 Write in direct discourse *si hic ordo . . . te esse* (*a*). Comment on the change of the mode and of the tense of *decreverit*.

12 Write biographic sketches of *two* of the following: Cicero, Mithridates, Pompey, Archias.

13 Decline, in singular and plural, *moribus* (*a*), *isti* (*b*) in the masculine, *parens* (*c*). Decline *persequendi* (*c*). Give the force of *illa* (*c*). Distinguish in meaning *sceleratae* and *nefariae* (*b*).

14 Give the composition of *each* of the following and show how the meaning of each is derived: *animadvertis* (*a*), *subegi* (*b*), *praedicant* (*c*). Mention an English word containing the stem of *libera* (*a*), *ego* (*b*), *primum*, *locis* (*c*).

15 Translate into English:

Mithridaticum vero bellum, magnum atque difficile et in multa varietate terra marique versatum, totum ab hoc expressum est: qui libri non modo L. Lucullum, fortissimum et clarissimum virum, verum etiam populi Romani nomen illustrant. Populus enim Romanus aperuit Lucullo imperante Pontum et regiis quondam opibus et ipsa natura et regione vallatum.

— Pro Archia Poeta, 9

High School Department

174TH EXAMINATION

CICERO'S ORATIONS

Friday, June 20, 1902—9.15 a. m. to 12.15 p. m., only

Answer the first six questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1-5 Translate into English:

a WHY CATILINE WAS ALLOWED TO LEAVE THE CITY

Sed cum *viderem* ne *vobis* quidem omnibus *re* etiam tum probata, si illum, ut erat meritus, *morte multassem*, *fore ut eius* socios invidia oppressus persequi non *possem*, rem huc deduxi, ut tum palam pugnare possetis, cum hostem aperte videretis. Quem quidem ego hostem, Quirites, *quam vehementer* foris *esse timendum putem*, licet hinc *intellegatis*, quod etiam illud moleste fero, quod ex urbe parum comitatus exierit. Utinam ille omnes secum copias suas eduxisset!—In Catilinam, 2, 2

b PROVISION SHOULD BE MADE FOR THOSE WHO SAVED THE STATE

Est etiam in nobis *is animus*, Quirites, ut non modo nullius *audaciae cedamus*, sed etiam omnes improbos ultro semper lacessamus. Quod si *omnis impetus* domesticorum hostium, depulsus a vobis, se in me unum converterit, *vobis* erit providendum, Quirites, qua *condicione* posthac eos esse velitis, qui se pro salute vestra *obtulerint invidiae* periculisque omnibus: *mihi quidem* ipsi quid est quod *iam* ad *vitae* fructum possit adquiri, cum praesertim neque in *honore vestro* neque in gloria virtutis quidquam videam altius, quo mihi libeat *ascendere?*—In Catilinam, 3, 12

c THE QUESTIONS TO BE CONSIDERED

Causa quae sit videtis: *nunc* quid agendum sit considerate. Primum mihi videtur de genere belli, *deinde* de magnitudine, tum de imperatore deligendo esse dicendum. Genus est belli eius *modi*, quod maxime vestros animos *excitare* atque inflammare ad *persequendi* studium *debeat:* in quo *agitur* populi Romani gloria, quae vobis a maioribus cum magna in omnibus rebus tum summa in re militari *tradita* est.

—Pro Lege Manilia, 2

6 Translate into Latin [Do not use rare or poetic constructions]:

- *a* If at first you had acted with the greatest zeal, you would never have yielded to any enemy.
- *b* Is Catiline in the city or has he departed with his shameless companions?

7 Translate into Latin [Do not use rare or poetic constructions]:

- *a* Do not consider their hatred, but provide for the safety of us all.
- *b* There is no one who will say that we must fear Catiline's forces.

8 Give the reason for the case of *morte*, *eius* (*a*), *audaciae*, *condicione* (*b*), *persequendi* (*c*); for the mode of *viderem*, *multassem*, *esse timendum* (*a*), *cedamus* (*b*), *debeat* (*c*).

9 Decline throughout *morte* (*a*), *is animus*, *omnis impetus* (*b*).

10 Give the reason for the case of *re* (*a*), the second *vobis* (*b*, line 4), *invidiae* (*b*), *mihi* (*b*, line 7), *modi* (*c*); for the mode of *putem*, *intellegatis* (*a*), *obtulerint*, *ascendere* (*b*), *excitare* (*c*).

11 Write the active and passive infinitives, the active and passive participles (including the gerundive) and the supines of *viderem* (*a*). Write the principal parts of *persequendi*, *agitur* (*c*).

12 Distinguish in use *iam* (*b*) and *nunc* (*c*). Account for the position of *vobis* (*a*), *quidem* (*b*); for the use of the circumlocution *fore ut . . . possem* (*a*). Mention and define the figure in *quam vehementer . . . putem* (*a*). Explain the reference in *honore vestro* (*b*).

13 Give an outline of the third oration against Catiline.

14 Give the composition of *each* of the following and show how the meaning of each is derived: *deinde*, *persequendi*, *tradita* (*c*). Give an English word containing the stem of *possem* (*a*), *cedamus*, *vitae* (*b*), *modi* (*c*).

15 Translate into English:

Sit igitur, iudices, sanctum apud vos, humanissimos homines, hoc poetae nomen, quod nulla umquam barbaria violavit. Saxa et solitudines voci respondent, bestiae saepe immanes cantu flectuntur atque consistunt: nos instituti rebus optimis non poetarum voce moveamur?—Pro Archia Poeta, 8

University of the State of New York

High School Department

172D EXAMINATION

VIRGIL'S AENEID

Tuesday, January 28, 1902 — 1.15 to 4.15 p. m., only

Answer the first six questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–5 Translate into English:

a AENEAS IS APPALLED AT THE STORM

Extemplo *Aeneae solvuntur frigore* membra;
Ingemit, et duplicis tendens ad sidera palmas
Talia voce refert: O terque quaterque beati,
Quis ante ora patrum Troiae sub moenibus altis
Contigit oppetere! o Danaum *fortissime* gentis
Tydide! mene Iliacis occumbere campis
Non *potuisse* tuaque *animam hanc effundere* dextra,
Saevus ubi Aeacidae telo *iacet Hector*, ubi ingens
Sarpedon, ubi tot Simois correpta sub undis
Scuta virum galeasque et *fortia corpora* volvit?—1, 92–101

b SINON ACCOUNTS FOR THE DEPARTURE OF THE GREEKS

Extemplo *temptanda* fuga canit *aequora Calchas*,
Nec posse Argolicis exscindi Pergama telis,
Omina ni *repetant Argis*, *numen*que *reducant*,
Quod pelago et curvis secum avexere *carinis*.
Et nunc, quod patrias vento *petiere* Mycenas,
Arma deosque *parant comites*, pelagoque remenso
Inprovisi aderunt.— 2, 176–182

c THE YOUNG MARCELLUS

Nec *puer* Iliaca *quisquam* de gente Latinos
In tantum spe *tollet* avos, nec *Romula* quondam
Ullo se tantum *tellus* iactabit alumno.
Heu pietas, heu prisca *fides*, invictaque bello
Dextera! non *illi* se quisquam inpune *tulisset*
Obvius armato, seu cum pedes *iret* in hostem,
Seu spumantis equi foderet calcaribus armos.— 6, 875–881

6 Translate into Latin [Do not use rare or poetic constructions]:

a) Unless we seek the aid of the gods we can not take the city, *b*) They fear that the enemy will carry away the armor of Hector, *c*) We must prepare many things for this war.

7 Translate into Latin [Do not use rare or poetic constructions]:

a) Would that I had died with my companions beneath the walls of Troy, *b*) The Greeks are already boasting, though the city is still unconquered, *c*) Let us destroy the Trojan citadel.

8 Give the reason for the case of *frigore*, *quis* (*a*), *aequora*, *Argis* (*b*), *illi* (*c*); for the mode of *oppetere*, *potuisse* (*a*), *repetant* (*b*), *tulisset*, *iret* (*c*).

9 Select from questions 1–5 an example of poetic construction and give the corresponding prose construction. Mention and explain the figure of speech in *carinis* (*b*). Explain the reference in *saevus Hector* (*a*), *omina repetant* (*b*), *Romula tellus* (*c*).

10 Decline *Aeneae* (*a*), *Calchas* (*b*). Decline, in the singular, *animam hanc* (*a*), *numen*, *comites* (*b*), *puer quisquam* (*c*). Compare *fortissime* (*a*).

11 Write an account of the *Aeneid*, touching on *three* of the following: *a*) general theme, *b*) purpose, *c*) influence of the works of Homer, *d*) literary merits.

12 Write the last *three* lines of (*a*), indicating quantity of syllables, division into feet and principal cesuras. Give the rule for the quantity of the penult of *fortia*, *corpora;* of the ultima of *iacet*, *scuta*.

13 Give the principal parts of *contigit*, *iacet* (*a*), *petiere*, *parant* (*b*), *tollet* (*c*).

14 Explain the derivation or composition of *contigit*, *effundere* (*a*), *reducant*, *inprovisi* (*b*), *obvius* (*c*). Mention an English word containing the stem of *each* of the following: *solvuntur*, *corpora* (*a*), *temptanda*, *petiere* (*b*), *fides* (*c*).

15 Translate into English:

Extemplo Libyae magnas it fama per urbes,
Fama, malum qua non aliud velocius ullum;
Mobilitate viget, virisque adquirit eundo;
Parva metu primo; mox sese attollit in auras,
Ingrediturque solo, et caput inter nubila condit.—4, 173–177

University of the State of New York

High School Department

173D EXAMINATION

VIRGIL'S AENEID

Wednesday, March 26, 1902 — 1.15 to 4.15 p. m., only

Answer the first six questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–5 Translate into English:

a PYRRHUS SLAYS POLITES, SON OF PRIAM

Ut tandem ante *oculos* evasit et *ora parentum*,
Concidit, ac *multo* vitam cum sanguine fudit.
Hic Priamus, quamquam in media iam *morte* tenetur,
Non tamen abstinuit, nec *voci* iraeque pepercit:
At tibi pro *scelere*, exclamat, pro talibus ausis,
Di, si qua est caelo pietas, quae talia *curet*,
Persolvant grates dignas et praemia *reddant*
Debita, qui nati coram me *cernere* letum
Fecisti et patrios foedasti *funere vultus.* — 2, 531–539

b DIDO BEHOLDS A PRODIGY

Tum vero infelix fatis exterrita Dido
Mortem orat; taedet caeli convexa tueri.
Quo *magis* inceptum *peragat* lucemque relinquat,
Vidit, turicremis cum *dona inponeret* aris—
Horrendum *dictu*—latices nigrescere sacros
Fusaque in obscenum *se vertere* vina cruorem.
Hoc visum nulli, non ipsi *effata sorori.* — 4, 450–456

c IRIS IS SENT DOWN BY JUNO

Hic primum fortuna fidem mutata novavit.
Dum variis *tumulo referunt sollemnia ludis*,
Irim de caelo misit *Saturnia* Iuno
Iliacam ad *classem*, ventosque adspirat *eunti*,
Multa movens, necdum *antiquum* saturata *dolorem*.
Illa, viam celerans per *mille coloribus* arcum,
Nulli visa cito decurrit tramite virgo.
Conspicit ingentem *concursum*, et litora lustrat,
Desertosque videt portus classemque relictam. — 5, 604–612

6 Translate into Latin [Do not use rare or poetic constructions]:

a) It is said that one of the sons of Priam fell and died in the presence of his father, *b*) Juno, seeing the suffering of Dido, sent Iris for the purpose of hastening her death.

7 Translate into Latin [Do not use rare or poetic constructions]:

a) Since the gods have spared our lives, we shall return thanks to them and bring gifts, *b*) If they should run down to the shore, they would see the fleet departing from the harbor.

8 Give the reason for the case of ***parentum***, ***voci*** (*a*), ***dictu*** (*b*), ***ludis***, ***coloribus*** (*c*); for the mode of ***curet***, ***persolvant*** (*a*), ***peragat***, ***inponeret***, ***vertere*** (*b*).

9 Decline, in the singular, ***scelere***, ***vultus*** (*a*), ***se*** (*b*), ***hoc*** (*b*) in the feminine, ***classem*** (*c*), ***eunti*** (*c*) in the masculine. Compare ***multo*** (*a*), ***magis*** (*b*).

10 Write the second person singular of ***each*** of the tenses of the indicative, subjunctive and imperative, active, of ***referunt*** (*c*). Write the principal parts of ***cernere*** (*a*), ***peragat*** (*b*).

11 Select from questions 1-5 *two* different examples of poetic construction, giving the corresponding prose construction in each case; an inceptive verb, explaining its formation. Distinguish in meaning ***ora*** and ***vultus*** (*a*), ***morte*** and ***funere*** (*a*).

12 Explain the reference in ***dona***, ***sorori*** (*b*), ***tumulo sollemnia***, ***Saturnia***, ***antiquum dolorem*** (*c*).

13 Write the last *three* lines of (*b*), indicating quantity of syllables, division into feet and principal cesuras. Give the rule for the quantity of the ultima in ***visum***, ***effata***; of the penult in ***vertere***, ***sorori***.

14 Give the composition of *each* of the following and show how the meaning of each is derived: ***reddant*** (*a*), ***inponeret*** (*b*), ***concursum*** (*c*). Write an English word containing the stem of ***oculos***, ***morte*** (*a*), ***dona*** (*b*), ***mille*** (*c*).

15 Translate into English:

Sic demum lucos Stygis et regna invia vivis
Aspicies. Dixit, pressoque obmutuit ore.
  Aeneas maesto defixus lumina vultu
Ingreditur, linquens antrum, caecosque volutat
Eventus animo secum. Cui fidus Achates
It comes, et paribus curis vestigia figit.—6, 154-159

University of the State of New York

High School Department

174TH EXAMINATION

VIRGIL'S AENEID

Tuesday, June 17, 1902 — 1.15 to 4.15 p. m., only

Answer the first six questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–5 Translate into English:

a THE FEAST

Talia voce *refert*, *curis*que ingentibus aeger
Spem vultu simulat, *premit* altum *corde* dolorem.
Illi *se* praedae *accingunt* dapibusque futuris:
Tergora deripiunt costis et viscera nudant;
Pars in frusta *secant* veribusque trementia figunt;
Litore aena locant alii, flammasque ministrant.
Tum victu *revocant viris*, fusique per herbam
Inplentur veteris Bacchi pinguisque ferinae.— 1, 208–215

b PROPHECY OF HELENUS

Nate dea — nam *te* maioribus ire per altum
Auspiciis manifesta fides: sic *fata deum rex*
Sortitur, *volvit*que vices; *is* vertitur ordo —
Pauca tibi e multis, quo tutior hospita *lustres*
Aequora et Ausonio possis *considere portu*,
Expediam *dictis;* prohibent nam cetera *Parcae*
Scire Helenum farique vetat Saturnia Iuno.— 3, 374–380

c REPLY OF NEPTUNE TO VENUS

Nec minor in terris, Xanthum Simoentaque testor,
Aeneae mihi cura tui. Cum Troia *Achilles*
Exanimata sequens *inpingeret* agmina muris,
Milia *multa* daret leto, gemerentque repleti
Amnes, nec reperire viam atque evolvere posset
In mare se Xanthus, *Pelidae* tunc ego *forti*
Congressum Aenean nec dis nec viribus aequis
Nube cava rapui, *cuperem* cum vertere ab *imo*
Structa meis manibus *periurae moenia Troiae.*— 5, 803–811

6 Translate into Latin [Do not use rare or poetic constructions]:

a They go for the purpose of finding a safer port.

b It is manifest that Aeneas represses the sorrow that is in his heart.

c If the fates should forbid, the walls of Troy could not be built by us.

7 Translate into Latin [Do not use rare or poetic constructions]:

a Let us follow our king on land and sea.

b It is said that these things are a care to the gods.

c We must pass over every sea before we can settle in Italy.

8 Give the reason for the case of *curis* (*a*), *dea*, *te*, *portu* (*b*), *Aeneae*, *mihi* (*c*); for the mode of *lustres*, *considere* (*b*), *iniungeret*, *cuperem* (*c*).

9 Explain the reference in *se accingunt* (*a*), *nate dea*, *deum rex*, *Parcae* (*b*), *periurae Troiae* (*c*).

10 Decline *Achilles*, *Pelidae* (*c*). Decline throughout *viris* (*a*), *dea* (*b*), the feminine of *is* (*b*). Compare *multa*, *imo* (*c*).

11 Give the reason for the case of *Bacchi* (*a*), *dictis* (*b*), *Pelidae* (*c*); for the number of *secant* (*a*). Write the principal parts of *refert*, *premit* (*a*), *volvit* (*b*).

12 Select from questions 1–5 *three* different figures of speech and define each figure selected. Give the reason for the voice of *inplentur* (*a*).

13 Write the last *three* lines of (*c*), indicating quantity of syllables, division into feet and principal cesuras. Give the rule for the quantity of the ultima of *moenia;* of the penult of *cuperem*. Define and illustrate dieresis.

14 Give the derivation of *each* of the following and show how the meaning of each is derived: *revocant* (*a*), *fata* (*b*), *Pelidae* (*c*). Give an English word containing the stem of *corde*, *veteris* (*a*), *scire* (*b*), *forti* (*c*).

15 Translate into English:

Interea magno misceri murmure caelum
Incipit; insequitur commixta grandine nimbus;
Et Tyrii comites passim et Troiana iuventus
Dardaniusque nepos Veneris diversa per agros
Tecta metu petiere; ruunt de montibus amnes.—4, 160–164

University of the State of New York

High School Department

172D EXAMINATION

VIRGIL'S ECLOGUES

Monday, January 27, 1902—9.15 a. m. to 12.15 p. m., only

Answer the first six questions and four of the others but* no more. *If more than four of the others are answered only the first four answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.

1–5 Translate into English:

a TITYRUS RETURNS FROM ROME

M. Mirabar, quid maesta deos, Amarylli, *vocares*,
Cui *pendere* sua *patereris* in *arbore* poma:
Tityrus hinc aberat. Ipsae te, Tityre, pinus,
Ipsi te fontes, ipsa haec arbusta vocabant.
T. Quid *facerem?* neque *servitio* me *exire* licebat,
Nec tam praesentis alibi cognoscere divos.
Hic *illum* vidi *iuvenem*, Meliboee, quot annis
Bis senos cui nostra *dies* altaria *fumant.*—1, 37–44

b THE COMING OF THE GOLDEN AGE

Aspice convexo nutantem *pondere* mundum,
Terrasque tractusque maris *caelum*que profundum,
Aspice, venturo laetantur ut omnia saeclo!
O mihi tam *longae maneat* pars *ultima vitae*,
Spiritus et, quantum sat erit tua dicere facta:
Non me *carminibus vincet* nec Thracius Orpheus,
Nec Linus, *huic* mater *quamvis* atque huic pater *adsit*,
Orphei *Calliopea*, Lino formosus *Apollo.*—4, 50–57

c THE GREETING TO THE VICTOR

Tu *mihi* seu magni superas iam saxa Timavi,
Sive oram Illyrici legis *aequoris*, en erit umquam
Ille dies, mihi cum *liceat* tua *dicere* facta?
En erit, ut *liceat* totum mihi *ferre* per orbem
Sola *Sophocleo* tua carmina *digna cothurno?*
A te principium, tibi desinet. *Accipe* iussis
Carmina coepta tuis, atque hanc sine tempora circum
Inter victricis *hederam* tibi serpere laurus.—8, 6–13

6 Translate into Latin [Do not use rare or poetic constructions]:

a While Tityrus was absent in the city, Amaryllis remained here among these rocks and trees.

b Thy deeds are so great that they are praised in the most remote parts of the earth.

7 Translate into Latin [Do not use rare or poetic constructions]:

a He says that Orpheus rejoices because Linus has been vanquished by me in song.

b Let us go to the altar of Apollo for the purpose of invoking that god.

8 Give the reason for the case of *dies* (*a*), *vitae*, *carminibus* (*b*), *mihi* (*c*, line 1), *aequoris* (*c*); for the mode of *vocares*, *exire* (*a*), *maneat*, *adsit* (*b*), *liceat* (*c*, line 3).

9 Write the principal parts of *pendere*, *patereris* (*a*), *aspice*, *vincet* (*b*), *accipe* (*c*).

10 Explain the reference in *illum iuvenem*, *bis senos dies* (*a*), *Calliopea* (*b*), *Sophocleo cothurno*, *hederam* (*c*).

11 Decline *Calliopea*, *Apollo* (*b*). Decline, in the singular, *arbore*, *iuvenem* (*a*), *caelum* (*b*), the neuter of *ille* (*c*). Mention and define *two* different figures of rhetoric found in questions 1-5.

12 Give the reason for the case of *servitio* (*a*), *huic* (*b*), *cothurno*, *hederam* (*c*); for the mode of *facerem* (*a*), *liceat* (*c*, line 4). Compare *longae*, *ultima* (*b*).

13 Write the first *three* lines of (*c*), marking quantity of syllables, division into feet and principal cesuras. Give the rule for the quantity of the penult in *dicere;* of the ultima in *dies*. Mention and define a figure of prosody found in these lines.

14 Give the composition of *each* of the following and show how the meaning of each is derived: *convexo*, *quamvis* (*b*), *accipe* (*c*). Give an English word containing the stem of *fumant* (*a*), *pondere* (*b*), *ferre*, *digna* (*c*).

15 Translate into English:

M. Forte sub arguta consederat ilice Daphnis,
Compulerantque greges Corydon et Thyrsis in unum,
Thyrsis ovis, Corydon distentas lacte capellas,
Ambo florentes aetatibus, Arcades ambo,
Et cantare pares, et respondere parati.— 7, 1-5

University of the State of New York

High School Department

174TH EXAMINATION

VIRGIL'S ECLOGUES

Monday, June 16, 1902—9.15 a. m. to 12.15 p. m., only

Answer the first six questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1-5 Translate into English:

a APPEAL TO ALEXIS

Nonne fuit satius tristis *Amaryllidis* iras
Atque superba pati fastidia? nonne *Menalcan*,
Quamvis ille *niger*, quamvis tu candidus *esses?*
O formose puer, nimium *ne crede* colori!
Alba ligustra *cadunt*, vaccinia nigra leguntur.
Despectus tibi sum, nec, *qui sim*, quaeris, *Alexi*,
Quam *dives* pecoris, nivei quam lactis abundans;
Mille meae Siculis *errant* in montibus agnae;
Lac *mihi* non *aestate* novum, non frigore defit.—2, 14-22

b INVITATION TO A MUTUAL EXHIBITION OF SKILL

Me. Cur non, Mopse, *boni* quoniam *convenimus* ambo,
Tu calamos inflare levis, ego dicere *versus*,
Hic corylis *mixtas* inter considimus ulmos?
Mo. Tu *maior; tibi me* est aequum *parere*, Menalca,
Sive sub incertas *zephyris* motantibus umbras,
Sive antro potius succedimus. Aspice, ut antrum
Silvestris raris sparsit labrusca *racemis*.
Me. Montibus in nostris *solus* tibi *certat* Amyntas.—5, 1-8

c LAMENT OF GALLUS

Nec lacrimis crudelis Amor, nec gramina rivis,
Nec cytiso saturantur apes, nec fronde capellae.
Tristis at ille: Tamen cantabitis, Arcades, inquit,
Montibus haec vestris: soli cantare periti
Arcades. O *mihi* tum quam *molliter ossa quiescant*,
Vestra meos olim si fistula *dicat* amores!
Atque utinam ex vobis unus, vestrique *fuissem*
Aut *custos* gregis, aut maturae *vinitor uvae!*—10, 29-36

6 Translate into Latin [Do not use rare or poetic constructions]:

a Corydon says that he will trust his flocks to this experienced herdsman.

b We shall sit on the grass under the elms that the goats may rest in the shade.

7 Translate into Latin [Do not use rare or poetic constructions]:

a Though I am rich and have many herds, yet lovely Alexis looks down on me.

b It is uncertain whether Amyntas will contend in singing with you or with Mopsus.

8 Give the reason for the case of *Amaryllidis*, *aestate* (*a*), *tibi* (*b*, line 4), *racemis* (*b*), *custos* (*c*); for the mode of *esses*, *sim* (*a*), *parere* (*b*), *quiescant*, *fuissem* (*c*).

9 Select from questions 1–5 *three* different poetic constructions and give the corresponding prose construction in each case. Explain the use of *nonne* (*a*, line 1), *ne* (*a*).

10 Give the reason for the case of *mihi* (*a*), *me*, *zephyris* (*b*), *mihi*, *uvae* (*c*). Compare *niger*, *dives* (*a*), *boni*, *maior* (*b*), *molliter* (*c*).

11 Decline *Menalcan*, *Alexi* (*a*). Decline throughout *qui* (*a*) in the feminine, *tu* (*b*), *solus* (*b*) in the masculine, *ossa* (*c*).

12 Write the principal parts of *cadunt*, *errant* (*a*), *convenimus*, *mixtas* (*b*), *dicat* (*c*).

13 Write the last *three* lines of (*b*), marking quantity of syllables, division into feet and principal cesuras. Give the rule for the quantity of the penult in *montibus*, of the ultima in *certat*. Define ictus.

14 Give the derivation or composition of *each* of the following and show how the meaning of each is derived: *despectus* (*a*), *versus* (*b*), *vinitor* (*c*). Give an English word containing the stem of *crede* (*a*), *solus* (*b*), *ossa*, *custos* (*c*).

15 Translate into English:

Necte tribus nodis ternos, Amarylli, colores;
Necte, Amarylli, modo, et, Veneris, dic, vincula necto.
Ducite ab urbe domum, mea carmina, ducite Daphnim.
Limus ut hic durescit et haec ut cera liquescit
Uno eodemque igni, sic nostro Daphnis amore.—8, 77–81

University of the State of New York

High School Department

172D EXAMINATION

LATIN—Second Year

Tuesday, January 28, 1902—1.15 to 4.15 p. m., only

Answer the first six questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1-5 Translate into English:

a LYSANDER ATTEMPTS TO BRIBE THE ORACLES

Primum *Delphicum corrumpere* est conatus. Cum id non potuisset, Dodonam adortus est. Hinc quoque repulsus dixit se vota *suscepisse*, quae Iovi Hammoni solveret, existimans *se* Afros *facilius* corrupturum. Hac spe cum profectus esset in Africam, *multum* eum antistites *Iovis* fefellerunt. Nam non solum corrumpi non potuerunt, sed etiam legatos *Lacedaemonem miserunt*, qui Lysandrum *accusarent*, quod sacerdotes fani corrumpere *conatus esset.*—Lysander, 3

b AGESILAUS RETURNS TO ASSIST SPARTA

Agesilaus opulentissimo *regno* praeposuit bonam existimationem multoque gloriosius duxit, si *institutis* patriae paruisset, quam si bello *superasset* Asiam. Hac igitur *mente Hellespontum* copias traiecit tantaque usus est celeritate, ut, quod *iter Xerxes anno* vertente *confecerat*, hic *transierit* triginta *diebus*. Cum iam haud ita longe *abesset* a *Peloponneso*, *obsistere* ei conati sunt Athenienses et Boeoti ceterique eorum socii apud Coroneam; quos omnes *gravi proelio* vicit.—Agesilaus, 4

c THE PRIVATE LIFE OF ATTICUS

Neque vero ille vir minus bonus pater familias habitus est quam *civis*. Nam cum *esset* pecuniosus, *nemo illo* minus fuit emax, minus aedificator. Neque tamen non in primis *bene* habitavit omnibusque optimis rebus *usus est*. Nam *domum* habuit in colle Quirinali Tamphilianam, ab avunculo *hereditate* relictam; cuius amoenitas non *aedificio*, sed silva constabat. Ipsum enim tectum antiquitus constitutum plus salis quam sumptus habebat; in quo nihil commutavit, nisi si *quid* vetustate *coactus est.*—Atticus, 13

6 Translate into Latin [Do not use rare or poetic constructions]:

a The ambassadors sent from Africa said that their priests could not be bribed by Lysander.

b Agesilaus set out for Asia with a very large army to attack the Persian kingdom.

7 Translate into Latin [Do not use rare or poetic constructions]:

a He did not obey the Athenians, when they commanded him to return to Sparta.

b Atticus wished to live in the old house that his uncle had left to him.

8 Give the reason for the case of *se* (*a*, line 3), ***regno***, ***Hellespontum***, ***anno*** (*b*), ***aedificio*** (*c*); for the mode of ***corrumpere*** (*a*, line 1), ***conatus esset*** (*a*), ***transierit***, ***abesset*** (*b*), ***esset*** (*c*).

9 Decline *Iovis* (*a*). Decline, in the singular, ***iter***, ***proelio*** (*b*), ***hereditate*** (*c*). Compare *facilius*, ***multum*** (*a*), ***bene*** (*c*).

10 Write the principal parts of ***suscepisse***, ***miserunt*** (*a*), ***superasset*** (*b*), ***usus est***, ***coactus est*** (*c*).

11 Give the reason for the case of *Iovis*, *Lacedaemonem* (*a*), ***institutis***, ***mente***, ***diebus*** (*b*), ***civis***, ***illo***, ***quid*** (*c*); for the mode of *suscepisse*, *accusarent* (*a*).

12 Mention and illustrate by original Latin sentences the mode used in indirect discourse in *a*) a principal declarative clause, *b*) a dependent clause, *c*) a command.

13 Give the location of *each* of the following: *Lacedaemonem* (*a*), *Hellespontum*, *Peloponneso* (*b*). Explain the reference in *Delphicum* (*a*), *iter Xerxes . . . confecerat* (*b*).

14 Give, with meaning of each part, the composition of ***obsistere*** (*b*), ***nemo***, ***aedificio*** (*c*). Mention an English word containing the stem of *facilius* (*a*), ***gravi*** (*b*), ***civis***, ***domum*** (*c*).

15 Translate into English:

At Hamilcar, posteaquam mare transiit in Hispaniamque venit, magnas res secunda gessit fortuna; maximas bellicosissimasque gentes subegit; equis, viris, pecunia totam locupletavit Africam. Hic cum in Italiam bellum inferre meditaretur, nono anno, postquam in Hispaniam venerat, in proelio pugnans adversus Vettones occisus est.—Hamilcar, 4

University of the State of New York

High School Department

174TH EXAMINATION

LATIN—Second Year

Tuesday, June 17, 1902—1.15 to 4.15 p. m., only

Answer the first six questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–5 Translate into English:

a MILTIADES FAILS TO CAPTURE PAROS

Cum iam in eo esset, ut oppido potiretur, procul in continenti lucus, qui ex insula conspiciebatur, nescio quo casu nocturno tempore incensus est. Cuius flamma ut ab oppidanis et oppugnatoribus est visa, *utrisque* venit in opinionem *signum* a classiariis *regis* datum. Quo factum est, ut et Parii a deditione deterrerentur, et Miltiades, timens ne classis regia *adventaret*, incensis operibus, quae statuerat, cum totidem navibus atque erat profectus, Athenas magna cum offensione civium suorum *rediret.* Accusatus ergo est *proditionis*, quod, cum *Parum* expugnare posset, a rege corruptus infectis rebus *discessisset.* Eo *tempore* aeger erat *vulneribus*, quae in oppugnando oppido acceperat.—Miltiades, 7

b APOLLO RECOMMENDS WOODEN WALLS FOR ATHENS

Cuius de *adventu* cum fama in Graeciam esset perlata et *maxime* Athenienses *peti* dicerentur propter *pugnam Marathoniam*, miserunt *Delphos* consultum, *quidnam facerent* de rebus suis. *Deliberantibus* Pythia respondit, ut moenibus ligneis se *munirent.* Id responsum quo *valeret*, cum intellegeret nemo, Themistocles *persuasit* consilium esse *Apollinis*, *ut* in naves se suaque *conferrent:* eum enim a *deo significari* murum ligneum.
—Themistocles, 2

c PAUSANIAS ENTERS INTO RELATIONS WITH THE PERSIANS

Post *id proelium eundem* Pausaniam cum classe communi *Cyprum* atque Hellespontum miserunt, ut ex his regionibus barbarorum praesidia *depelleret.* *Pari felicitate* in ea *re* usus elatius se *gerere* coepit maioresque appetere res. Nam cum *Byzantio* expugnato *cepisset* complures Persarum nobiles atque in his nonnullos regis propinquos, hos clam Xerxi remisit, simulans ex vinclis publicis effugisse.—Pausanias, 2

6 Translate into Latin [Do not use rare or poetic constructions]: (*a*) At the approach of the Athenian fleet the Parians were so afraid that they went into the town, (*b*) The Persians knew that Pausanias was about to storm the walls.

7 Translate into Latin [Do not use rare or poetic constructions]: (*a*) The works that were burned had been built by the citizens of the island, (*b*) Miltiades withdrew with all his men when the signals of the enemy began to be seen.

8 Give the reason for the case of ***signum, proditionis*** (*a*), ***Delphos, deliberantibus*** (*b*), ***felicitate*** (*c*); for the mode of ***adventaret, rediret, discessisset*** (*a*), ***facerent, munirent*** (*b*).

9 Write the principal parts of ***rediret, discessisset*** (*a*), ***munirent, persuasit*** (*b*), ***depelleret*** (*c*).

10 Decline the following in the singular: ***vulneribus*** (*a*), ***adventu, deo*** (*b*), ***pari felicitate, re*** (*c*), the masculine and feminine of ***quidnam*** (*b*), the masculine and neuter of ***eundem*** (*c*).

11 Give the reason for the case of ***utrisque, tempore, vulneribus*** (*a*), ***Apollinis*** (*b*), ***Byzantio*** (*c*); for the mode of ***significari*** (*b*), ***gerere, cepisset*** (*c*). State the syntax of the clause ***ut . . . conferrent*** (*b*). Compare ***maxime*** (*b*).

12 Explain the difference in use between the gerund and the gerundive; the supine in ***um*** and the supine in ***u***. Write and translate original Latin sentences illustrating the use of each.

13 Give the location of *two* of the following: ***Parum*** (*a*), ***Cyprum, Byzantio*** (*c*). Explain the reference in ***three*** of the following: ***regis*** (*a*), ***cuius, pugnam Marathoniam, Apollinis*** (*b*), ***id proelium*** (*c*).

14 Give, with meaning of each part, the derivation or composition of *each* of the following: ***rediret, discessisset*** (*a*), ***significari*** (*b*). Mention an English word containing the stem of ***signum*** (*a*), ***adventu, peti, valeret*** (*b*).

15 Translate into English:

In hac conclusione, quotienscumque voluit, apparatum et munitiones Antigoni alias incendit, alias disiecit. Tenuit autem se uno loco, quamdiu hiems fuit, quod castra sub divo habere non poterat. Ver appropinquabat: simulata deditione, dum de condicionibus tractat, praefectis Antigoni imposuit seque ac suos omnes extraxit incolumes.—Eumenes, 5

University of the State of New York

High School Department

172D EXAMINATION

LATIN—Third Year

Tuesday, January 28, 1902—1.15 to 4.15 p. m., only

Answer the first seven questions and three of the others but **no more.** *If more than three of the others are answered only the first three answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–5 Translate into English:

a JUGURTHA CAPTURES THE ARMY OF AULUS

Nostri foeda fugā plerique abiectis *armis*, proximum collem occupavere. Nox atque praeda *castrorum* hostis quo minus victoria *uterentur* remorata sunt. Deinde Iugurtha postero die cum Aulo in colloquio verba facit: tametsi ipsum cum exercitu fame et ferro clausum teneret, tamen *se* memorem humanarum rerum, si secum foedus *faceret*, incolumis omnis sub iugum missurum; praeterea uti *diebus* decem *Numidia* decederet. Quae quamquam gravia et *flagiti* plena erant, tamen, quia mortis metu mutabantur, sicuti *regi* libuerat, pax convenit.
—Sallust, Bellum Iugurthinum, 38

foedus (line 1)=dishonorable

b CAESAR'S GREAT ACHIEVEMENT

Domuisti gentes *immanitate* barbaras, multitudine innumerabiles, locis infinitas, omni copiarum genere abundantes: sed tamen ea vicisti, quae et naturam et condicionem ut *vinci* possent habebant. Nulla est enim tanta vis quae non *ferro* et viribus debilitari frangique *possit*. Animum vincere, iracundiam cohibere, victoriam temperare, adversarium nobilitate, ingenio, virtute praestantem non modo extollere iacentem, sed etiam amplificare eius pristinam dignitatem, haec qui facit, non ego eum cum summis viris comparo, sed simillimum *deo* iudico.—Cicero, Pro Marcello, 3

immanitas=ferocity

c VENUS PLEADS WITH JUPITER FOR THE TROJANS

O pater, o hominum rerumque aeterna potestas!
Namque aliud quid sit, quod iam inplorare queamus?
Cernis, ut insultent Rutuli, Turnusque feratur
Per medios insignis equis tumidusque secundo
Marte ruat? Non clausa *tegunt* iam moenia Teucros
Quin intra portas atque ipsis proelia *miscent*
Aggeribus murorum, et inundant sanguine fossae.
—Virgil, Aeneid, 10, 18–24

queo=be able, *insulto*=exult

6 Translate into Latin [Do not use rare or poetic constructions]: The Romans considered it dishonorable to be sent

under the yoke; therefore when Jugurtha conquered them he said that he would make a treaty only on this condition.

7 Translate into Latin [Do not use rare or poetic constructions]: Do not hinder me from departing. I have said that I shall go to Rome within twenty days whether it pleases you or not.

8 Give the syntax of *armis*, *castrorum*, *se*, *diebus*, *Numidia*, *flagiti*, *regi* (*a*), *immanitate*, *ferro*, *deo* (*b*).

9 Give the reason for the mode of *uterentur*, *faceret* (*a*), *vinci*, *possit* (*b*). Write the principal parts of *vinci* (*b*), *tegunt*, *miscent* (*c*).

10 Translate into English:

Defectione Aeduorum cognita bellum augetur. Legationes in omnes partes circummittuntur: quantum gratia, auctoritate, pecunia valent, ad sollicitandas civitates nituntur. Nacti obsides, quos Caesar apud eos deposuerat, horum supplicio dubitantes territant. Petunt a Vercingetorige Aedui ut ad se veniat rationesque belli gerendi communicet.

—Caesar, De bello Gallico, 7, 63

11 Write a brief account of *two* of the following: funeral games in honor of Anchises, Caesar's invasion of Britain, Jugurtha, Cicero as consul.

12 Translate into English:

Iusserat; hi redeunt, ac fontibus ora relaxant,
Et defrenato volvuntur in aequora cursu.
Ipse tridente suo terram percussit; at illa
Intremuit motuque vias patefecit aquarum.
Exspatiata ruunt per apertos flumina campos.

—Ovid, Metamorphoses 1, 281–285

defrenatus=unrestrained, *exspatior*=spread out

13–14 Translate into English:

Apud Xenophontem autem moriens Cyrus maior haec dicit: "Nolite arbitrari, o mihi carissimi filii, me cum a vobis discessero nusquam aut nullum fore. Nec enim dum eram vobiscum animum meum videbatis, sed eum esse in hoc corpore ex iis rebus quas gerebam intellegebatis. Eundem igitur esse creditote, etiam si nullum videbitis. Nec vero clarorum virorum post mortem honores permanerent, si nihil eorum ipsorum animi efficerent quo diutius memoriam sui teneremus. Mihi quidem nunquam persuaderi potuit animos dum in corporibus essent mortalibus vivere, cum exissent ex iis emori."

—Cicero, De senectute, 22

nusquam=nowhere, *emorior*=die

15 Write original Latin sentences illustrating *three* of the following: *a*) dative of the agent, *b*) substantive clause of result, *c*) past condition contrary to fact, *d*) ablative of degree of difference, *e*) ablative of manner.

High School Department

174TH EXAMINATION

LATIN — Third Year

Tuesday, June 17, 1902 — 1.15 to 4.15 p. m., only

Answer the first seven questions and three of the others but **no more.** *If more than three of the others are answered only the first three answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–5 Translate into English:

a PLANCUS IS ATTACKED BY AFRANIUS

Cuius adventu nuntiato, L. Plancus, qui legionibus praeerat, necessaria re coactus, locum capit superiorem, diversamque aciem in duas partes constituit ne ab equitatu circumveniri *posset.* Ita, congressus impari *numero,* magnos impetus legionum equitatusque sustinet. Commisso ab equitatibus proelio, signa duarum legionum procul ab utrisque *conspiciuntur,* quas C. Fabius ulteriore *ponte subsidio* nostris miserat, suspicatus fore id, quod accidit, ut duces adversariorum occasione et beneficio fortunae *ad nostros opprimendos uterentur.*

— Caesar, De Bello Civili, 1, 40

b LIGARIUS SUCCEEDS TO THE COMMAND IN AFRICA

Q. enim Ligarius, cum *esset* nulla *belli* suspicio, legatus in Africam cum C. Considio *profectus est:* qua in legatione et civibus et sociis ita se probavit, ut decedens Considius provincia satis facere hominibus non posset, si quemquam alium provinciae *praefecisset.* Itaque Ligarius, cum diu recusans nihil profecisset, provinciam accepit invitus: cui sic praefuit in pace, ut et *civibus* et sociis gratissima esset eius integritas ac fides. Bellum subito exarsit, quod qui erant in Africa ante audierunt geri quam parari. — Cicero, Pro Ligario, 1

c ATLAS IS CHANGED INTO A MOUNTAIN BY PERSEUS

Viribus inferior — quis enim par *esset* Atlanti
Viribus? — At quoniam *parvi* tibi gratia nostra est,
Accipe munus, ait; laevaque a parte Medusae
Ipse retroversus squalentia prodidit ora.
Quantus erat, *mons* factus Atlas: nam barba comaeque
In silvas abeunt, iuga sunt humerique manusque:
Quod caput ante fuit, summo est in monte cacumen.

— Ovid, Metamorphoses, 4, 653–659

squalens = horrid, *cacumen* = peak

6 Translate into Latin [Do not use rare or poetic constructions]:

(*a*) Have you heard whether the bridge has been captured or not? (*b*) Let us engage battle before we are surrounded by the cavalry, (*c*) Do not station the legions far from the mountain.

7 Translate into Latin [Do not use rare or poetic constructions]:

Though Ligarius was unwilling to accept the chief command, yet he was so pleasing to all on account of his integrity that Considius departing from Africa, placed him over that province.

8 Give the reason for the case of *numero*, *ponte*, *subsidio* (*a*), *belli* (*b*), *civibus* (*b*, line 7), *viribus* (*c*, line 1), *parvi*, *mons* (*c*). Change *ad nostros opprimendos* (*a*) to a dependent clause of equivalent meaning.

9 Give the reason for the mode of *posset*, *uterentur* (*a*), *esset* (*b*, line 1), *esset* (*c*); for the mode and tense of *praefecisset* (*b*). Write the principal parts of *conspiciuntur* (*a*), *profectus est* (*b*).

10 Translate into English:

Interea Iugurtha, ubi quae Metellus agebat ex nuntiis accepit, simul de innocentia eius certior Romae factus, diffidere suis rebus ac tum demum veram deditionem facere conatus est. Igitur legatos ad consulem cum suppliciis mittit, qui tantummodo ipsi liberisque vitam peterent, alia omnia dederent populo Romano.—Sallust, Bellum Iugurthinum, 46

11 Write an account of *one* of the following: the political career of Cicero, the rivalry between Caesar and Pompey and its political results to Rome, the descent of Aeneas to the lower world.

12 Translate into English:

Ast ego, magna Iovis coniunx, nil linquere inausum
Quae potui infelix, quae memet in omnia verti,
Vincor ab Aenea. Quod si mea numina non sunt
Magna satis, dubitem haud equidem inplorare quod usquam est.
Flectere si nequeo superos, Acheronta movebo.

nequeo=be unable —Virgil, Aeneid, 7, 308–312

13–14 Translate into English:

Si tu et Tullia, lux nostra, valetis, ego et noster filius Cicero valemus. Pridie Idus Octobres Athenas venimus, cum sane adversis ventis usi essemus tardeque et incommode navigassemus. De nave exeuntibus nobis Acastus cum litteris praesto fuit uno et vicesimo die, sane strenue. Accepi tuas litteras, quibus intellexi te vereri ne superiores mihi redditae non essent. Omnes sunt redditae diligentissimeque a te perscripta sunt omnia; idque mihi gratissimum fuit. Neque sum admiratus hanc epistulam, quam Acastus attulit, brevem fuisse; iam enim me ipsum exspectas sive nos ipsos, qui quidem quam primum ad vos venire cupimus, etsi in quam rem publicam veniamus intellego.—Cicero, Ad Familiares, 14, 5

valeo=be well, *sane strenue*=very promptly

15 Write Latin sentences in which *cum* (causal), *quin*, *priusquam*, *ne non* and *quo* are used to introduce subordinate clauses.

High School Department

172D EXAMINATION

LATIN PROSE COMPOSITION

Monday, January 27, 1902—9.15 a. m. to 12.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

Translate into Latin [Do not use rare or poetic constructions]:

1 If the Sequani should attempt to cross through our territories, we should attack them and drive them back.

2 Miltiades, fearing that the king's fleet would come, returned to Athens with all his ships.

3 May Catiline depart from the city and lead out with him those who have been his companions.

4 After Caesar saw in how great danger the soldiers of the tenth legion were, he sent them aid.

5 Since no one opposed Hannibal, he remained near Rome many days before he led back his army to Capua.

6 Caesar says that he will not besiege the towns of those nations that are friendly to the Roman people.

7 Although Nepos wrote concerning many Romans, the lives of two men only, Cato and Atticus, have been transmitted to us.

8–9 There is no one who does not think that on the thirty-first of December, in the consulship of Lepidus and Tullus, you stood in the comitium with a weapon.

10–11 When Caesar was about to lead his forces against the Gauls, the Belgians persuaded their neighbors not to give grain and supplies to the Roman army.

12–13 We shall speak of those things that concern the safety of us all. It is Catiline's purpose to kill many leading men of this state and to destroy this city with fire and slaughter.

14–15 The Lacedaemonians sent legates to forbid the Athenians to build walls about their city. After the legates had arrived, Themistocles set out for Sparta, and meanwhile slaves and freemen built the walls.

lead out=educo, *besiege*=oppugno, *transmit*=trado, *concern* =pertineo, *leading man*=princeps, *slaughter*=caedes, *forbid* =veto, *freeman*=liber

High School Department

174TH EXAMINATION

LATIN PROSE COMPOSITION

Monday, June 16, 1902—9.15 a. m. to 12.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

Translate into Latin [Do not use rare or poetic constructions]:

1 After Caesar had drawn up the infantry in line, he commanded that the baggage be placed in the rear.

2 The Athenians punished Miltiades because they feared that he might become a tyrant at Athens.

3 There is no one in this city who thinks that Catiline did not attempt to kill the consul.

4 Though the enemy were hurling javelins at our men, we got possession of the camp at daybreak.

5 Pausanias wrote letters to the Persian king in which he promised to subdue Greece for the Persians.

6 There is no doubt that Caesar has sent the tenth legion as an aid to our soldiers.

7 When Thrasybulus was waging war in Asia, the barbarians, having made a sally from one of their towns, killed him.

8–9 Let it be said that Catiline has been driven from Rome by me, provided that he go into exile. But, believe me, he does not intend to go.

10–11 If I were seeking any favor from Caesar, I should go to him. But I can not do this, nor can I return the hostages of the Aedui, that I have with me.

12–13 Since you have been rescued from a very cruel and wretched death, celebrate with your wives and children the thanksgiving that has been decreed today to the immortal gods.

14–15 Finally the Carthaginians sent ambassadors to make peace with the Romans. The latter answered that they would not accept any terms of peace, while Hannibal commanded the Carthaginian army.

punish=*multo*, tyrant=*tyrannus*, sally=*eruptio*, intend=*in animo habeo*, thanksgiving=*supplicatio*, terms=*condicio*

High School Department

171ST EXAMINATION

ARITHMETIC

Thursday, September 26, 1901 — 9.15 a. m. to 12.15 p. m., only

---

Answer the first five questions and five of the others but **no more.** *If more than five of the others are answered only the first five answers will be considered. Give all operations (except mental ones) necessary to find results. Reduce each result to its simplest form and mark it Ans. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Simplify $\frac{(\frac{3}{7}\times 2\frac{1}{3})\div(\frac{3}{5}\times 7\frac{1}{2})+\frac{3}{4}\times\frac{8}{9}}{\frac{1}{2}\text{ of }(\frac{3}{4}-\frac{9}{16})\times(1-\frac{5}{9})}$

2 Multiply three and fifteen tens of thousandths by one and one hundredth, and divide the product by four and five hundredths. Express the result in words.

3 A train travels 495 kilometers in 9 hours at a uniform rate of speed; how many meters a minute does it travel?

4 Find the interest of $810 from October 28, 1898 till today at 3½%.

5 A merchant bought 351 bushels of wheat for $234; he sold half of the wheat at a gain of 15% and the rest at cost. Find the average gain on one bushel.

6 Find the greatest common divisor and the least common multiple of 714 and 935.

7 Find the cost, at 65 cents a cubic yard, of excavating a cellar 15 feet square and 9 feet deep.

8 A merchant asks for successive discounts of 15% and 5% on a bill of $850, but he is offered instead discounts of 10% and 10%; find the difference between the two net amounts.

9 The walls and ceiling of a room 16 feet by 14 feet contain 944 square feet; how high is the room?

10 A tax of $6750 is levied on a certain village whose assessed valuation is $4,500,000; what is the tax on a house assessed at $8500?

11 Find the cost, at 62½ cents a square yard, of paving a circular court 42 feet in diameter.

12 An agent sells a piano and after deducting his commission of 5½%, sends his principal $472.50; find the agent's commission.

13 Find the face of a note for 90 days the proceeds of which are $824 when it is discounted at a bank at 7%.

14 A man gave away $\frac{1}{6}$ of the books in his library, lent $\frac{1}{5}$ of the remainder and sold $\frac{1}{3}$ of those left; he then had in his possession 360 books. How many books had he at first?

15 How much must a man invest in 4% bonds at 112⅞, brokerage ⅛%, so that his annual income may be $1620?

High School Department

172D EXAMINATION

ARITHMETIC

Thursday, January 30, 1902—9.15 a. m. to 12.15 p. m., only

Answer the first five questions and five of the others but **no more.** *If more than five of the others are answered only the first five answers will be considered. Give all operations (except mental ones) necessary to find results. Reduce each result to its simplest form and mark it Ans. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Simplify $\frac{\frac{7}{16}+1\frac{1}{2}\times\frac{2}{3}+\frac{1}{8}}{1\div(\frac{5}{8}-\frac{1}{16})}$ and express the result both as a common fraction and as a decimal fraction.

2 A rectangular tank 2 meters 5 decimeters long and 1 meter 4 decimeters wide holds 28.7 hectoliters; find the depth of the tank.

3 Find the simple interest of $836 at 2½% from May 31, 1901 to the present date.

4 Find the cost, @ $15 per M, of 75 pieces of lumber each 14′×16″×1¾″.

5 A man bought a farm of 196 acres for $9800 and after spending $980 for improvements, sold the farm at $66 an acre; what was his per cent of gain?

6 Reduce $\frac{5423}{7163}$ to its lowest terms.

7 Find the cost, @ 60¢ a yard, of carpeting a room 16 feet 4 inches wide and 21 feet 6 inches long with carpet 27 inches wide, if the strips of carpet run lengthwise.

8 Find the net proceeds on the sale of 576 barrels of flour @ $7.50 a barrel, the commission being 3½% and the freight and storage being 33¢ a barrel.

9 Find the square root of 3 to *three* decimal places.

10 How many bushels will a bin hold that is 7 feet long, 4 feet wide and 3⅓ feet deep? [2150.4 cubic inches=1 bushel.]

11 Find the proceeds of a 60 day note for $830 without interest, dated December 21, 1901 and discounted today at a bank at 6%.

12 A merchant buys cloth at $1.20 a yard and marks it so as to sell it at a discount of 20% from the list price and still gain 20%; find the list price of the goods.

13 A house worth $12,000 was insured for ⅞ its value by three companies; the first took ⅓ the risk at ⅙%, the second ⅕ the risk at ¼%, and the third the remainder at ⅜%. What was the whole premium paid?

14 What is the loss on 40 shares of stock bought at 109⅞ and sold at 106⅜, brokerage being ⅛% in each case?

15 Define *five* of the following: common fraction, common multiple, numerator, composite number, proportion, evolution, discount.

High School Department

173D EXAMINATION

ARITHMETIC

Tuesday, March 25, 1902—9.15 a. m. to 12.15 p. m., only

Answer the first five questions and five of the others but **no more.** *If more than five of the others are answered only the first five answers will be considered. Give all operations (except mental ones) necessary to find results. Reduce each result to its simplest form and mark it Ans. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Multiply two hundred twenty-five and five hundredths by two hundred four ten-thousandths, and divide the product by five hundred twenty-five thousandths. Express the result in words.

2 The weight of the water in a tank 5 decimeters 8 centimeters long and 3 decimeters 8 centimeters wide is 92.568 kilograms; how deep is the tank?

3 Find the amount of $216 at $2\frac{1}{2}$% simple interest from July 28, 1899 till today.

4 A merchant gained $12\frac{1}{2}$% by selling 48 yards of silk for $4.50 more than cost; find the cost a yard of the silk.

5 A man raised $962.85 by having his note for 90 days discounted at a bank at 7%; for what sum was the note drawn?

6 Simplify $3-[\frac{3}{8}-\frac{1}{16}+(\frac{1}{4}+\frac{9}{10}\div\frac{3}{5})]$

7 On a bill for $280.50 a man is offered successive discounts of 10% and 5% for cash; to what single rate of discount is this equivalent and what is the net amount of the bill?

8 Find the cost, @ $37\frac{1}{2}$¢ a square yard, of plastering the walls and ceiling of a room 20 feet 6 inches long, 15 feet 6 inches wide and 9 feet 6 inches high, allowing for 3 doors each 3 feet by 7 feet and for 4 windows each 3 feet by 6 feet.

9 A bin 8.4 feet long, 4.12 feet wide and 3 feet deep is $\frac{2}{3}$ full of grain; how many bushels of grain are there in the bin? [2150.4 cubic inches=1 bushel.]

10 Make a receipted bill of the following: John Mack buys this day of Adams & Co., 4 bushels potatoes @ 60¢, 3 dozen eggs @ 22¢, 10 pounds sugar @ $6\frac{3}{4}$¢, 5 pounds cheese @ 14¢, 15 pounds meal @ 2¢.

11 A commission merchant sold 744 bushels of wheat and sent his employer $527.31, retaining a commission of $30.69; find the rate of commission and the selling price a bushel of the wheat.

12 How many rods of fencing are required to inclose a square field containing $12\frac{1}{10}$ acres?

13 What income will be derived from investing $14,060 in $3\frac{1}{2}$% bonds purchased at $87\frac{3}{4}$, brokerage $\frac{1}{8}$%?

14 A man pays taxes amounting to $68.31, after receiving a rebate of 1% for prompt payment. If the rate of taxation is $1\frac{1}{2}$%, what is the assessed valuation of his property?

15 Define *five* of the following: minuend, mixed number, multiple, compound fraction, proportion, interest, discount.

High School Department

174TH EXAMINATION

ARITHMETIC

Thursday, June 19, 1902—9.15 a. m. to 12.15 p. m., only

Answer the first five questions and five of the others but **no more.** *If more than five of the others are answered only the first five answers will be considered. Give all operations (except mental ones) necessary to find results. Reduce each result to its simplest form and mark it Ans. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Define *five* of the following: abstract number, greatest common divisor, board foot, present worth, root, duty, gram.

2 Simplify $\frac{1.75\times.5+.325-.33\frac{1}{3}\times2.1}{.25+.049+014}$ and express the result as a common fraction.

3 A man borrowed $837 September 12, 1899 and paid it today, with interest at 5%; what amount did he pay?

4 A man sold a carriage for $207 thereby gaining 12½%; how much did he gain?

5 Find the cost, @ 35¢ a square meter, of plastering the walls and ceiling of a room 6 meters 6 decimeters long, 5 meters 5 decimeters wide and 2 meters 8 decimeters high.

6 Divide the least common multiple of 812 and 336 by their greatest common divisor.

7 Find the cost of the following bill of lumber: 20 scantlings 14′ long, 4″ wide and 3″ thick @ $30 per M; 16 planks 10′ long, 14″ wide and 2″ thick @ $20 per M.

8 A commission merchant was sent $704.52 which he invested in 950 bushels of wheat, after deducting his commission of 3%; find the cost a bushel of the wheat.

9 Two successive discounts of 15% and 10% reduced a bill to $489.60; what was the original bill?

10 Find the cost, @ 45¢ a roll, of papering the walls of a room 16½ feet long, 15 feet wide and 12 feet high, making no allowances for openings. [A roll of paper is 8 yards long and 18 inches wide.]

11 What sum must be invested in 6½% stock at 185 to yield an annual income of $481?

12 A man bought 227 pounds of butter @ 19¾¢ a pound and paid the bill with the proceeds of a bank note for 60 days at 6%; find the face of the note.

13 How long must a ladder be to reach a window 15 feet high, if the foot of the ladder is 8 feet from the house?

14 It costs $36.18 to insure a store at ¾%; find the face of the policy.

15 What will it cost, @ 8½¢ a square yard, to paint the convex surface of a cylindric boiler 6 feet high and 5 feet in diameter?

High School Department

172D EXAMINATION

ADVANCED ARITHMETIC

Monday, January 27, 1902—9.15 a. m. to 12.15 p. m., only

Answer eight questions but **no more.** *If more than eight are answered only the first eight answers will be considered. Give each step of solution. Express final result in its simplest form and mark it Ans. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

1 Find by division the greatest common divisor of 4718 and 2233. Give a demonstration of the process.

2 The sum of two numbers is 161 and their difference is 74; find the numbers and demonstrate the principle involved.

3 Divide .8487432 by .075637 and multiply the quotient by .835642; find the result correct to *three* decimal places, using the contracted methods of division and multiplication of decimals.

4 Find the weight in pounds of the oil contained in a cylindric tank 1.5 meters in diameter and 1.8 meters high. [A kilogram equals $2\frac{1}{5}$ pounds and oil is .8 as heavy as water.]

5 Trade discounts of 10%, 10% and x% are equivalent to a direct discount of $23\frac{1}{20}$%; find the value of x.

6 The areas of two spheres are to each other as 1 is to 2, the radius of the larger sphere is 5 inches; find the radius of the smaller sphere correct to *two* decimal places.

7 Insert *three* geometric means between the extremes $\frac{2}{3}$ and $\frac{2}{1875}$

8 An electric light is 4 times as intense as a gas light 15 feet from it; at what point between the two lights must an object be placed so as to be illuminated equally by the two lights? [The intensity of light varies inversely as the square of the distance from the source of illumination.]

9 When exchange is at 5.18, find the gain on 100 meters of silk bought in Paris @ 2 francs a meter and sold in New York @ 89¢ a yard, the duty being 60% ad valorem.

10 If $\frac{5}{8}$ of a ton of coal costs $3.75, what will $\frac{3}{5}$ of a ton cost? Write the analysis in full.

11 Find the face of a sight draft that can be bought for $585.80 when exchange is at a premium of $\frac{3}{8}$%.

12 Washington is 77° 3′ west longitude and Pekin 116° 29′ east longitude; when it is 9.30 p. m., Tuesday, December 31, 1901 at Washington, what is the time of day, the day of the week and the date at Pekin?

High School Department

174TH EXAMINATION

ADVANCED ARITHMETIC

Monday, June 16, 1902—9.15 a. m. to 12.15 p. m., only

Answer eight questions but no more. *If more than eight are answered only the first eight answers will be considered. Give each step of solution. Express final result in its simplest form and mark it Ans. Each complete answer will receive* $12\frac{1}{2}$ *credits. Papers entitled to 75 or more credits will be accepted.*

1 Express in words *each* of the following: 600.035, .635, $600\frac{30}{5000}$, $\frac{630}{5000}$, $\frac{635}{1000}$

2 Prove by a general method that a common divisor of two numbers is a divisor of their sum, of their difference and of their product.

3 If I sell $\frac{2}{3}$ of a farm for what $\frac{4}{5}$ of the farm cost, what is my per cent of gain? Give analysis in full.

4 State how to determine (*a*) what common fractions give pure circulating decimals, (*b*) what common fractions give mixed circulating decimals, (*c*) the limit of the number of places in the repetend. Demonstrate each principle.

5 A man sold 700 shares of railway stock at $84\frac{1}{8}$ and invested the proceeds in $4\frac{1}{2}$% bank stock at $119\frac{7}{8}$, brokerage in each case $\frac{1}{8}$%; find the annual income from the second investment.

6 In extracting cube root state and explain the process of (*a*) separating into periods, (*b*) forming the trial divisor, (*c*) completing the divisor.

7 Mention the French unit of (*a*) length, (*b*) area, (*c*) volume, (*d*) capacity, (*e*) weight. Show how the unit of length was originally determined and how each of the other units is related to it.

8 Find the cost, @ 12¢ a square yard, of painting the convex surface of a conical turret whose diameter is 8 feet and whose vertical hight is 7.5 feet.

9 A New York merchant remitted to London through his broker £12,000 18s 9d; find the cost of the draft if exchange is at $4.89\frac{1}{4}$ and brokerage is $\frac{1}{4}$%.

10 An agent buys machines at 10% and 20% off the list price and sells them at 10% and 5% off the list price; find his per cent of gain.

11 A body on the surface of the earth weighs 27 pounds; assuming that the radius of the earth is 4000 miles, find the weight of the same body 2000 miles above the surface. [The weight of a body above the surface of the earth varies inversely as the square of the distance from the center of the earth.]

12 A man pays a debt in monthly payments in such a way that each payment is $2\frac{1}{2}$ times the preceding payment; his first payment is $5.12 and his last payment is $1250. Find the amount of the debt and the number of months it takes the man to pay it.

High School Department

170TH EXAMINATION

ALGEBRA

August 1901 — Three hours, only

Answer the first four questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Division of groups is not allowed. Give each step of solution. Reduce fractions to lowest terms. Express final result in its simplest form and mark it Ans. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

1 Simplify $\dfrac{\dfrac{x}{x-y}\times\left(\dfrac{x}{y}-2+\dfrac{y}{x}\right)}{\left(x+\dfrac{3xy+y^2}{x-y}\right)\div\dfrac{x+y}{(x-y)^2}}$

2 Factor $4x^4-4x^2y^2+9y^4$, $a^{4m}-b^{2n}$, $a^2b^2+a^2x-b^2x^2-x^3$, a^6+b^6, $4x^2y^4-1+6x-9x^2$

3 Solve $\begin{cases} x+2y=12 \\ xy+y^2=32 \end{cases}$

4 Solve $\sqrt{x}+\sqrt{x+a}=\dfrac{2a}{\sqrt{x+a}}$

5 Multiply $a^{b+1}+a^b+a$ by $a^{-b}-a^{-b+1}$

6 Expand by the binomial theorem $\left(\dfrac{x}{y}-\dfrac{y^2}{2}\right)^5$, giving all the work for finding the coefficients.

7 Solve $\dfrac{5z-x}{2y-3z}=1$, $\dfrac{y-2z}{3y-2x}=1$, $\dfrac{3y-2x}{3z-7}=\dfrac{1}{2}$

8 The difference of the cubes of two consecutive numbers is 817; find the numbers.

9 Solve $\dfrac{x-a}{x}+\dfrac{x}{x-a}=\dfrac{5}{2}$

10 Simplify $\frac{1}{2}\sqrt{27}+\frac{1}{2}\sqrt{147}-\sqrt{5\frac{1}{3}}$; $x\sqrt{x}+y\sqrt{y}\div\sqrt{x}+\sqrt{y}$; $\dfrac{2\sqrt{a-b}\sqrt{b}}{\sqrt{a-b}\sqrt{b}}$

11 A man wishing to give 35 cents to each of a certain number of boys, finds that he lacks 20 cents, but that he can give each boy 33 cents and have 4 cents left; what sum has he and how many boys are there?

12 Find the cube root of $8a^3+12a^2-54a-59+\dfrac{135}{a}+\dfrac{75}{a^2}-\dfrac{125}{a^3}$

13 Find the least common multiple of $a^4-2a^3+4a^2-6a+3$ and $a^4-a^3-2a^2+3a-1$

14-15 Solve $\begin{cases} xy-2y^2=1 \\ x^2+xy=12 \end{cases}$

High School Department

171ST EXAMINATION

ALGEBRA

Tuesday, September 24, 1901—9.15 a. m. to 12.15 p. m., only

Answer the first four questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Give each step of solution. Reduce fractions to lowest terms. Express final result in its simplest form and mark it Ans. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

1 Simplify $\dfrac{\left(\frac{x}{y}+1\right)\left(\frac{x}{y^2}-\frac{1}{y}+\frac{1}{x}\right)}{\frac{x^2+y^2}{y(x-y)}-\frac{y}{x}}$

2 Factor *five* of the following: $a^2b+4ab^2+3b^3$, $ab+b-a-1$, $6a^2-13ab+6b^2$, $3x^2-12y^2$, a^4+4a^2+16, $x^3-3x^2y+3xy^2-y^3$, a^5-32

3 Simplify $ab-[2ab-\overline{ab+7b^2}-\{-b(5b-4a)-2b(a-\overline{a-b})\}]$

4 Solve $\begin{cases} x^2-xy=a^2+b^2 \\ xy-y^2=2ab \end{cases}$

5 Divide $a^{n+3}-3a^{n+1}+a^{n-1}$ by a^2-a-1

6 Find the highest common factor (greatest common divisor) of $3a^4+2a^3-2a^2+3a-2$ and $2a^4+a^3+4a-3$

7 In 6 hours A walks 2 miles more than B walks in 7 hours: in 9 hours B walks 11 miles more than A walks in 5 hours. Find the number of miles an hour that A and B each walk.

8 Solve $3x-\left(2x-\frac{x+7}{5}\right)=\frac{x-4}{6}+9$

9 Solve $3x^2-14x=24$

10 Find the square root of $16x^4-8x^2+\frac{16x^2y}{3}-\frac{4y}{3}+\frac{4y^2}{9}+1$

11 Solve $\begin{cases} 2x+3y-3z=15 \\ 4x-\ y-\ z=15 \\ \ x-2y+2z=\ 4 \end{cases}$

12 Solve $\dfrac{\sqrt{1+x}+\sqrt{1-x}}{\sqrt{1+x}-\sqrt{1-x}}=2$

13 Write out by the binomial theorem the first *four* terms of $\left(\frac{m}{2}-2\right)^7$, giving all the work for finding the coefficients.

14 The product of two numbers is 2; their sum is 1 greater than their product. Find the numbers.

15 Simplify $(2\sqrt{a}+5\sqrt{b})(4\sqrt{b}-\sqrt{a})$; $\sqrt{\frac{(x-y)^5}{8a^3}}\div\frac{2}{xy}\sqrt{\frac{x-y}{2a}}$; $1\frac{3}{5}\sqrt{20}-\sqrt{\frac{1}{5}}-\sqrt{45}$

University of the State of New York

High School Department

172D EXAMINATION

ALGEBRA

Monday, January 27, 1902—9.15 a. m. to 12.15 p. m., only

Answer the first four questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Give each step of solution. Reduce fractions to lowest terms. Express final result in its simplest form and mark it Ans. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

1 Simplify $\dfrac{a-\left(b-\dfrac{b^2}{a}\right)}{\dfrac{a^3+b^3}{a(a-b)}}-\dfrac{a+b}{a-b}$

2 Factor a^3+8, $4x^2-7xy+3y^2$, $ac-3a-2bc+6b$, a^8-b^8, $a^{2n}+6a^n+9$

3 Solve $x^2=3bx-2b^2$

4 Write out by the binomial theorem the first *four* terms of $(2a-b)^5$, giving all the work for finding the coefficients.

5 Divide $a^{x+1}-a^{x-2}b^3$ by $a-b$

6 Find the greatest common divisor (highest common factor) of $2a^4-3a^3+7a^2-12a-4$ and $2a^3-11a^2+11a+4$

7 A square grass plot would contain 73 square feet more if each side were one foot longer; find the side of the plot.

8 Solve $\begin{cases}\dfrac{m}{x}+\dfrac{n}{y}=a\\[2mm]\dfrac{n}{x}+\dfrac{m}{y}=b\end{cases}$

9 Solve $\begin{cases}x+y=7\\x^3+y^3=133\end{cases}$

10 Simplify $(a-\sqrt{ab}+b)(\sqrt{a}+\sqrt{b})$; $\frac{1}{2}\sqrt{3}-\sqrt{\frac{1}{3}}+\sqrt{\frac{3}{16}}-\sqrt{\frac{1}{12}}$; $(x-y)\div(\sqrt{x}+\sqrt{y})$

11 Solve $\dfrac{20}{\sqrt{15+x}}-\sqrt{x}=\sqrt{15+x}$

12 The sum of two numbers is 16; the sum of their squares minus 67 equals the product of the two numbers. Find the numbers.

High School Department

173D EXAMINATION

ALGEBRA

Tuesday, March 25, 1902—9.15 a. m. to 12.15 p. m., only

Answer the first four questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Give each step of solution. Reduce fractions to lowest terms. Express final result in its simplest form and mark it Ans. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

1 Simplify $3x-[y-\{y-\overline{x+y}-(-y-\overline{2y-x-y})\}]$

2 Factor *five* of the following: a^3+216, y^4+y^2+1, m^5+1, a^2-b^2-a-b, $(a+b)^2-(c-d)^2$, $x^{2a}+2x^a+1$, $16a^2+10ab-9b^2$

3 Find the highest common factor (greatest common divisor) of $a^5-11a^4+42a^3-71a^2+61a-30$ and $a^3-9a^2+26a-24$

4 Solve $5x^2-6x=1\frac{2}{5}$

5 Write out by the binomial theorem the first *four* terms of $(a-2b)^8$, giving all the work for finding the coefficients.

6 A boy is $\frac{1}{4}$ as old as his father and 3 years younger than his sister; the sum of the ages of the three is 57 years. Find the age of the father.

7 Solve $\begin{cases} 3x+2y-z=8 \\ 2x+3y+6z=2 \\ x-y-5z=4 \end{cases}$

8 Extract the square root of $a^{4m}+4a^{3m}+2a^{2m}-4a^m+1$

9 Solve $\begin{cases} x^2-4y^2=13 \\ x+2y=13 \end{cases}$

10 The difference between the contents of two cubic blocks is 387 cubic feet; an edge of the smaller block is 3 feet shorter than an edge of the larger block. Find the edge of each block.

11 Solve $\frac{12}{\sqrt{x^2+8}}=\sqrt{x^2+8}+x$

12 Simplify $(x-\sqrt{ax}-6a)\div(\sqrt{x}+2\sqrt{a})$; $\frac{1}{\sqrt[4]{(1+\sqrt[3]{a^2})^3}}$;
$(2-2\sqrt{x})^2$

High School Department

174TH EXAMINATION

ALGEBRA

Monday, June 16, 1902—9.15 a. m. to 12.15 p. m., only

Answer the first four questions and four of the others but **no more.** *If more than four of the others are answered only the first four answers will be considered. Give each step of solution. Reduce fractions to lowest terms. Express final result in its simplest form and mark it Ans. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

1 Simplify $\frac{x^2+x+1}{(x+1)^2-x^2} \div \frac{x+\frac{1}{1+x}}{1+\frac{x}{1+x}}$

2 Factor *five* of the following: a^4-2a^2+1, $12m^2-7m+1$, $a^{3m}-1$, $6a^2-2ab-3a+b$, $81-a^4$, x^7+1, $a^2+2ab+b^2-c^2$

3 Solve $\frac{3x}{4}+2x-3=8$ and give an axiom as authority for each step of the solution.

4 Solve $ax^2+bx=c$

5 Write out by the binomial theorem the first *four* terms of $(a-\frac{1}{2})^7$, giving all the work for finding the coefficients.

6 Three numbers are such that the sum of the reciprocals of the first and second equals $\frac{1}{2}$; the sum of the reciprocals of the first and third equals $\frac{1}{3}$; the sum of the reciprocals of the second and third equals $\frac{1}{4}$. Find the numbers.

7 Solve $\begin{cases} x^3+y^3=28 \\ x^2-xy+y^2=7 \end{cases}$

8 Find the cube root of $27x^3-27x^2+63x-37+\frac{42}{x}-\frac{12}{x^2}+\frac{8}{x^3}$

9 Solve $x-5=\sqrt{20+x-x^2}$

10 If 2 is subtracted from three times a certain number and 1 is added to twice that number, the product of the two results will equal 208; find the number.

11 Simplify $2\sqrt{112}-\frac{2}{3}\sqrt{63}-3\sqrt{\frac{1}{7}}+2\sqrt{1\frac{3}{4}}$; $(2\sqrt{x}-x\sqrt{2})^2$; $(x-y)\div(\sqrt{x}-\sqrt{y})$

12 Define common multiple, like terms, equation, complete quadratic, surd.

University of the State of New York

High School Department

172D EXAMINATION

ADVANCED ALGEBRA

Tuesday, January 28, 1902—9.15 a. m. to 12.15 p. m., only

Answer eight questions but **no more.** *If more than eight are answered only the first eight answers will be considered. Give each step of solution. Reduce fractions to lowest terms. Express final result in its simplest form and mark it Ans. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

1 In any system of logarithms, express the logarithm of *a*) unity, *b*) the base, *c*) zero. Give proof for each case.

2 Solve $2\sqrt[n]{x}+2x^{-\frac{1}{n}}=5$

3 Expand by the binomial theorem $(1+2x)^{-\frac{1}{2}}$ to *five* terms.

4 How many different parties, each consisting of 3 soldiers and 4 sailors, can be formed out of 12 soldiers and 16 sailors?

5 Derive a formula for determining the value of the ratio when the extremes and the number of terms are known. Insert *four* geometric means between 486 and 2.

6 One of the roots of the equation $x^4-4x^3-8x+32=0$ is $-1+\sqrt{-3}$; find the other *three* roots of the equation.

7 Transform $x^4+4x^2+3x+5=0$ into an equation whose roots are double the roots of the given equation but have opposite signs.

8 Prove by a general method that the successive convergents of a continued fraction are alternately less and greater than the true value of the continued fraction.

9 By the method of differences find the 12th term of the series 4, 11, 28, 55, 92 etc.

10 Revert to *four* terms $y=x+3x^2+5x^3+7x^4+\ldots$

11 Prove that a factor can be found that will rationalize any binomial surd.

12 Apply determinants in the solution of $\begin{cases} 3x+4y=18 \\ x+2y=8 \end{cases}$

High School Department

174TH EXAMINATION

ADVANCED ALGEBRA

Tuesday, June 17, 1902—9.15 a. m. to 12.15 p. m., only

Answer eight questions but **no more.** *If more than eight are answered only the first eight answers will be considered. Give each step of solution. Reduce fractions to lowest terms. Express final result in its simplest form and mark it Ans. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

1 Define cologarithm, divergent series, combinations, reciprocal equations, derived polynomial.

2 Prove by a general method that if four quantities are in proportion, they will be in proportion by (*a*) inversion, (*b*) composition, (*c*) alternation.

3 Solve as a quadratic $3x^2+15x+1-2\sqrt{x^2+5x+1}=3$

4 Given $\log 2=.3010$, $\log 18=1.2553$; find $\log 3$, $\log 450$, $\log \frac{1}{12}$, $\log 18\frac{3}{4}$.

5 Solve $ax^2+bx+c=0$. State the conditions under which the roots will be (*a*) real and equal, (*b*) rational and unequal, (*c*) imaginary and unequal.

6 Solve $x^5-4x^4-10x^3+40x^2+9x-36=0$

7 Find the square root of $2m-2\sqrt{m^2-n^2}$

8 Expand $\sqrt{1-3x+2x^2}$ to *four* terms by the method of undetermined coefficients.

9 Derive the formula for the number of permutations of n different things taken r at a time.

10 Transform $x^3+6x^2-4x+5=0$ into an equation whose second term is wanting.

11 Find by the method of differences the sum of 12 terms of the series -3, 4, 14, 27 etc.

12 Prove that if a is a root of the general equation of the n^{th} degree, the first member of the equation is divisible by $x-a$.

University of the State of New York

High School Department

170TH EXAMINATION

PLANE GEOMETRY

August 1901—Three hours, only

Answer eight questions but **no more**, *including at least one from each of the three divisions. If more than eight are answered only the first eight answers will be considered. Draw carefully and neatly each figure in construction or proof, using letters instead of numerals. Arrange work logically. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

First division 1 Prove that the perpendicular is the shortest line that can be drawn to a straight line from an external point.

2 Complete and demonstrate the following: an angle formed by two secants, two tangents, or a tangent and a secant, drawn to a circle from an external point, is measured by . . .

3 Prove that two triangles whose sides are respectively parallel or respectively perpendicular are similar.

4 Complete and demonstrate the following: in any triangle the square of the side opposite an acute angle is equal to . . .

5 Prove that a circle can be circumscribed about any regular polygon.

Second division 6 Find the ratio of an angle of a regular octagon to the exterior angle formed by producing one of the sides of the angle.

7 The ratio of the radii of two circles, one of which lies wholly within the other, is 3 to 4; what part of the larger circle is included between the two circumferences?

8 The bases of a trapezoid are 30 in. and 12 in. respectively, the altitude is 9 in.; find the altitudes of the two triangles formed by producing the legs of the trapezoid till they meet.

9 Two tangents, each 6 in. long, drawn from an exterior point to a circle, intercept an arc of 60°; find the distance of the exterior point from the center of the circle.

10 On a given line 5 in. long a segment of a circle is described which contains an angle of 45°; find the length of the radius of the circle.

Third division 11 Prove that any line drawn through the middle point of a diagonal of a parallelogram divides the parallelogram into two equal parts.

12 Show how to construct a square equivalent to a given rhomboid.

13 Prove that the bisector of the vertical angle of a triangle forms with the bisector of one of the exterior angles at the base, an angle equal to ½ the other angle at the base.

14 On the sides of the triangle ABC equilateral triangles ABD, BCF and ACE are drawn; prove that lines FA, DC and BE are equal.

15 Show how to inscribe a square in a given semicircle.

University of the State of New York

High School Department

171ST EXAMINATION

PLANE GEOMETRY

Wednesday, September 25, 1901—9.15 a.m. to 12.15 p.m., only

Answer eight questions but **no more,** *including at least one from each of the three divisions. If more than eight are answered only the first eight answers will be considered. Draw carefully and neatly each figure in construction or proof, using letters instead of numerals. Arrange work logically. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

First division 1 Prove that from a point without a straight line only one perpendicular can be drawn to the line.

2 Prove that two right triangles are equal if the hypotenuse and a leg of the one are equal respectively to the hypotenuse and a leg of the other.

3 Prove that a radius perpendicular to a chord bisects the chord and its subtended arc.

4 Prove that the areas of two rectangles are to each other as the products of their bases by their altitudes.

5 Prove that two regular polygons of the same number of sides are similar.

Second division 6 The base of a triangle is 12 in., its sides are 6 in. and 8 in. respectively; a line parallel to the base of the triangle cuts off a triangle equal to ¼ of the first triangle. Find the three sides of the smaller triangle.

7 The inscribed angle formed by a diameter and the side of a regular polygon inscribed in the circle, intercepts an arc of 165°; how many sides has the polygon?

8 The bases of an isosceles trapezoid are 15 in. and 9 in. respectively; each leg is 5 in. Find the length of a diagonal.

9 The radius of a circle inscribed in an equilateral triangle is r; find the area of the triangle.

10 The side of a regular polygon inscribed in a circle is 3 in.; the side of the regular inscribed polygon of double the number of sides is 1⅞ in. Find the radius of the circle.

Third division 11 Show how to draw through two sides of a triangle a line parallel to the third side so that the part intercepted by the sides shall have a given length. Give proof.

12 Prove that in an isosceles trapezoid the lines joining the middle points of the sides taken in succession, form a rhombus.

13 If the sides AD and BC of a trapezium ABCD inscribed in a circle are produced till they meet at E, prove that the triangle ABE and CDE are similar.

14 Prove that the angle at the center of a regular polygon is the supplement of an angle of the polygon.

15 In the parallelogram ABCD lines are drawn from B and D to E, any point in the diagonal AC; prove that the triangles AED and AEB are equal in area.

High School Department

172D EXAMINATION

PLANE GEOMETRY

Wednesday, January 29, 1902—9.15 a. m. to 12.15 p. m., only

Answer eight questions but no more, *including at least one from each of the three divisions. If more than eight are answered only the first eight answers will be considered. Draw carefully and neatly each figure in construction or proof, using letters instead of numerals. Arrange work logically. Each complete answer will receive* 12½ *credits. Papers entitled to 75 or more credits will be accepted.*

First division 1 State *three* conclusions of the following and prove *one* of them: if two parallels are cut by a transversal . . .

2 Prove that in the same circle or in equal circles equal chords are equally distant from the center.

3 Prove that if a line is drawn through two sides of a triangle parallel to the third side, it divides those sides proportionally, when the segments are incommensurable.

4 State the proportion that exists between the areas of two similar polygons and their homologous sides. Give proof.

5 Prove that a circle can be circumscribed about any regular polygon.

Second division 6 The legs of a right triangle are 5 inches and 12 inches respectively; find the altitude on the hypotenuse and the projections of the legs on the hypotenuse.

7 An angle inscribed in a circle and an angle formed by two tangents drawn from an exterior point to the circle, intercept the same arc. The inscribed angle is 48°; find the angle formed by the tangents.

8 The radius of a circle is 8 inches; find the area of the segment subtended by the side of an inscribed square.

9 One of the acute angles of a rhombus is 60° and the shorter diagonal is 20 feet; find the area of the rhombus.

10 The point P is 6 inches from the center of a circle whose radius is 10 inches; find the longest and the shortest chord and the product of the segments of any chord drawn through P.

Third division 11 Show how to construct a circle tangent to two given parallel lines and passing through a given point unequally distant from the two lines.

12 Prove that the radius of a circle circumscribed about an equilateral triangle is $\frac{2}{3}$ the altitude of the triangle.

13 Prove that if from a point in the base of an isosceles triangle parallels to the legs are drawn, the perimeter of the parallelogram formed equals the sum of the legs of the triangle.

14 Prove that if two tangents drawn from an exterior point to a circle form an angle of 120°, the distance from the point to the center of the circle is equal to the sum of the tangents.

15 Prove that two isosceles triangles having an angle of one equal to the homologous angle of the other are similar.

University of the State of New York

High School Department

173D EXAMINATION

PLANE GEOMETRY

Monday, March 24, 1902—9.15 a. m. to 12.15 p. m., only

Answer eight questions but **no more,** *including at least one from each of the three divisions. If more than eight are answered only the first eight answers will be considered. Draw carefully and neatly each figure in construction or proof, using letters instead of numerals. Arrange work logically. Each complete answer will receive $12\frac{1}{2}$ credits. Papers entitled to 75 or more credits will be accepted.*

First division 1 Define hypothesis, locus of a point, altitude, diameter, rhomboid.

2 Prove that if the opposite sides of a quadrilateral are equal, the figure is a parallelogram.

3 Prove that two mutually equiangular triangles are similar.

4 Prove that in the same circle or in equal circles equal arcs are subtended by equal chords. State the converse of this theorem.

5 Complete and demonstrate the following: the area of a regular polygon is equal to . . .

Second division 6 The three sides of an obtuse triangle are 4 inches, 13 inches and 15 inches respectively; find the altitude on the shortest side.

7 Two tangents to a circle 12 inches in diameter form an angle of 60°; find in inches the length of the arc between the points of contact.

8 A circular drive is 15 feet wide and the inclosed grass plot is 80 feet in diameter; find the area of the drive.

9 From *P*, a point $6\frac{1}{8}$ inches from the center of a circle whose diameter is 5 inches, a secant and a tangent are drawn; find the length of the tangent and the product of the secant and its external segment.

10 A rectangle and an equilateral triangle have equal areas and bases; their bases are each 4 inches. Find the altitude of the rectangle.

Third division 11 Show how to construct *a*) a circumference equal in length to the difference of two given circumferences, *b*) a circle equal in area to the sum of two given circles.

12 Prove that the sum of the perpendiculars dropped from the middle points of two sides of a triangle to the third side, is equal to the altitude on the third side.

13 Prove that two trapezoids are equal if their sides taken in order are equal each to each.

14 In a circle, chord CD intersects chord AB at E so that arc AC equals arc BC; prove that $CE:AC::AC:CD$.

15 Prove that tangents to a circle at the extremities of any two diameters form a rhombus.

University of the State of New York

High School Department

174TH EXAMINATION

PLANE GEOMETRY

Wednesday, June 18, 1902—9.15 a. m. to 12.15 p. m., only

Answer eight questions but no more, *including at least one from each of the three divisions. If more than eight are answered only the first eight answers will be considered. Draw carefully and neatly each figure in construction or proof, using letters instead of numerals. Arrange work logically. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

First division 1 Prove that of two oblique lines drawn from the same point in a perpendicular to a given line, cutting off unequal distances from the foot of the perpendicular, the line that cuts off the greater distance is the longer.

2 Prove that two triangles are equal if the three sides of the one are equal respectively to the three sides of the other.

3 Prove that lines which meet in a point intercept proportional segments on two parallel lines.

4 Complete and demonstrate the following: an angle formed by two chords intersecting within the circumference is measured by . . .

5 Complete and demonstrate the following: the square on the hypotenuse of a right triangle is equivalent to . . .

Second division 6 The sides of a triangle inscribed in a circle intercept arcs which have the ratio of 3:7:8; find the number of degrees in each angle of the triangle.

7 How many sides has the polygon the sum of whose interior angles is twice the sum of its exterior angles made by producing each of the sides in succession?

8 The base of a triangle is 20 inches and the altitude is 8 inches; find the area of the trapezoid cut off by a line parallel to the base and 6 inches from the vertex.

9 The areas of two circles are as 9:4; the radius of the larger circle is 6 inches. Find the circumference of the smaller circle.

10 The distance from the center of a chord 12 feet long, to the center of its arc is 2½ feet; find the radius of the circle.

Third division 11 On a given base, show how to construct a rectangle equivalent to a given rhombus. Give proof.

12 Show how to construct a circumference having a given radius and passing through two given points. Give proof.

13 Prove that the sum of the perpendiculars drawn from any point in the base of an isosceles triangle to the legs is equal to the altitude on one of the legs.

14 Prove that if from any point in the circumference of a circle a chord and a tangent are drawn, the perpendiculars to them from the middle point of the subtended arc are equal.

15 Prove that if the inscribed and circumscribed circles of a triangle are concentric, the triangle is equilateral.

University of the State of New York

High School Department

172D EXAMINATION

SOLID GEOMETRY

Friday, January 31, 1902 — 1.15 to 4.15 p. m., only

Answer eight questions but **no more,** *including at least two from each division. If more than eight are answered only the first eight answers will be considered. Draw carefully and neatly each figure in construction or proof, using letters instead of numerals. Arrange work logically. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

First division 1 Define *five* of the following: vertical diedral angles, prism, tetraedron, directrix, great circle, polar triangles, spheric excess of a triangle.

2 Prove that if two planes are perpendicular to each other, a straight line drawn in one of them perpendicular to their intersection is perpendicular to the other plane.

3 Complete and demonstrate the following: the lateral area of a prism is equal to . . .

4 Give the formula for the volume of *a*) a rectangular parallelepiped, *b*) a pyramid. Derive *one* of these formulas.

5 Complete and demonstrate the following: the lateral area of a frustum of a cone of revolution is equal to . . .

6 Prove that the sum of the angles of a spheric triangle is greater than 180° and less than 540°.

Note — Use π instead of its approximate value 3.1416.

Second division 7 Find the volume of a regular octaedron whose edge is 4 inches.

8 A rectangle 3 feet wide and 7 feet long revolves about one of its longer edges as an axis; find the lateral area and the volume of the solid generated.

9 Find the volume and surface of a regular hexagonal prism inscribed in a cylinder 7 inches in hight and 4 inches in diameter.

10 Find the contents of a pail 15 inches deep, 16 inches in diameter at the top and 12 inches in diameter at the bottom.

11 A square prism and a sphere have equal volumes; the prism is 10 inches high and an edge of its base is 4 inches. Find the radius of the sphere.

12 Prove that if two planes intersect each other the vertical diedral angles are equal.

High School Department

174TH EXAMINATION

SOLID GEOMETRY

Friday, June 20, 1902 — 1.15 to 4.15 p. m., only

Answer eight questions but **no more,** *including at least two from each division. If more than eight are answered only the first eight answers will be considered. Draw carefully and neatly each figure in construction or proof, using letters instead of numerals. Arrange work logically. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

First division 1 Prove that the intersection of two planes is a straight line.

2 Prove that two diedral angles are equal if their plane angles are equal.

3 Prove that two triedral angles are equal or symmetric when the three face angles of the one are equal respectively to the three face angles of the other.

4 Complete and demonstrate the following: the volume of a triangular pyramid is equal to . . .

5 Complete and demonstrate the following: the area of the surface generated by the revolution of a straight line about an axis in the plane of this line, but not parallel to it, is equal to . . .

6 Prove that in two polar triangles each angle of the one is the supplement of the opposite side in the other.

NOTE — Use π instead of its approximate value 3.1416.

Second division 7 Find the locus of points in space equidistant from the points a and b and at a given distance d from the point c. Give proof.

8 The base of a prism 24 inches high is an isosceles trapezoid whose parallel sides 12 inches apart are respectively 18 inches and 8 inches; find the volume and the lateral area of the prism.

9 Find the volume of a regular tetraedron whose altitude is $\sqrt{6}$.

10 The diagonal of the base of a regular square pyramid is 6 inches; the altitude of the pyramid is 4 inches. Find the volume and the total area of the cone of revolution circumscribing the pyramid.

11 Find the radius of the sphere whose number of square units of surface equals the number of cubic units of volume.

12 The bases of the frustum of a regular pyramid are regular hexagons whose sides are 2 inches and 3 inches respectively; the altitude of the frustum is 6 inches. Find the volume of the frustum.

High School Department

172D EXAMINATION

TRIGONOMETRY

Thursday, January 30, 1902—9.15 a. m. to 12.15 p. m., only

Answer eight questions but **no more.** *Include at least three from the third division if credit is desired for both plane and spheric trigonometry. If more than eight are answered only the first eight answers will be considered. Division of groups is not allowed. A, B and C represent the angles of a triangle, a, b and c the opposite sides. In a right triangle C represents the right angle. Each complete answer will receive* 12½ *credits. Papers entitled to* 75 *or more credits will be accepted.*
Give special attention to arrangement of work.

First division 1 Perform the operations indicated in the following expressions, using logarithms where possible: $\overline{2.18}^6$, $\sqrt[5]{7776}$, $21\times 18\times .05$, $\frac{45\times 63}{14+13}$

2 The two legs of a right triangle are 5 feet and 12 feet respectively; express as common fractions the values of *six* functions of the smaller angle of the triangle.

3 Write the algebraic sign of each of *six* functions of *a*) an angle of 175°, *b*) an angle of 225°.

4 Assuming the values of $\sin(A+B)$ and $\cos(A+B)$; find the value of $\tan 2A$ in terms of $\tan A$.

Second division 5 Prove that in any plane triangle $\frac{c}{a+b}=\frac{a-b}{m-n}$, m and n being the segments of c made by a perpendicular from C.

6 In a right triangle $c=128$ feet, $A=37°\ 30'$; find B, a and b.

7–8 Given $b=75$, $c=64$, $C=27°\ 30'$; find *two* possible values for B and for a.

Third division 9 Write the four formulas known as Napier's analogies.

10 Given in a spheric triangle $a=174°\ 13'$, $b=94°\ 8'$, $c=90°$; find the three angles.

11 Given $a=52°\ 45'$, $b=71°\ 12'\ 40''$, $A=46°\ 22'$; find *two* possible values for B.

12 Prove that in any spheric triangle $\cos A=\sin B \sin C \cos a-\cos B \cos C$.

High School Department

174TH EXAMINATION

TRIGONOMETRY

Thursday, June 19, 1902—9.15 a. m. to 12.15 p. m., only

Answer eight questions but **no more.** *Include at least three from the third division if credit is desired for both plane and spheric trigonometry. If more than eight are answered only the first eight answers will be considered. Division of groups is not allowed. A, B and C represent the angles of a triangle, a, b and c the opposite sides. In a right triangle C represents the right angle. Each complete answer will receive* $12\frac{1}{2}$ *credits. Papers entitled to 75 or more credits will be accepted.*
Give special attention to arrangement of work.

First division 1 Without using the tables, derive the numeric value of *each* of the following: sin 45°, sin 30°, sin 15°.

2 Assuming the values of sin $(A+B)$ and cos $(A+B)$, prove that $\sin 4A = 4 \sin A \cos^3 A - 4 \cos A \sin^3 A$

3 Given $\tan A = \frac{3}{4}$ and $\sin A = -\frac{3}{5}$; write the values of *four* other functions of A. In which quadrant is A?

4 Given $\log 2 = 0.301030$, $\log \frac{1}{3} = \bar{1}.522879$; without using the tables, find to *six* decimal places the logarithms of 3, $\frac{1}{8}$, $\sqrt[3]{12}$, $\frac{20}{27}$, 36^4.

Second division 5–6 At a point A the angle of elevation of the top of a church spire is 30° 57′ 45″; from a point 50 feet directly above A the angle of elevation is 21° 48′. Find the vertical hight of the top of the spire above the level of A, and the horizontal distance of the spire from A.

7 The sides of a triangle are respectively 128 feet, 142 feet and 165 feet; find the smallest angle and the area of the triangle.

8 Assuming the radius of the earth to be 4000 miles, find the radius of the arctic circle and the distance of the center of this circle from the pole. [Latitude of the arctic circle is 66° 30′ north.]

Third division 9 Given $a = 50° 12'$, $b = 116° 44'$, $c = 129° 12'$; find A.

10–11 Given $A = 110°$, $B = 133° 30'$, $a = 147° 6'$; find b, c and C.

12 When the altitude of the sun east of the meridian is 32° 15′ and its declination is 18° 40′ north, find the apparent local time at Albany, latitude 42° 40′ north.

University of the State of New York

High School Department

172D EXAMINATION

ASTRONOMY

Thursday, January 30, 1902 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered the first 10 answers will be considered. Each complete answer receive 10 credits. Papers entitled to 75 or more credits will be accep*

1 Define *five* of the following: apogee, gravitation, satell nutation, penumbra, node, conjunction.

2 Mention the three systems of circles, points and meas ments used in locating a point on the celestial sphere. Descr *one* of these systems.

3 Describe *a*) the physical constitution of the sun, *b*) a sci tific method of determining the physical constitution of the s

4 Mention *two* proofs that the earth *a*) rotates on its a *b*) revolves around the sun.

5 Define precession of the equinoxes. Explain by diag or otherwise the causes of the precession of the equinoxes.

6 Distinguish between the sidereal day and the solar d Explain what is meant by the equation of time.

7 Explain by aid of a diagram the phenomenon of the harv moon.

8 Mention the conditions necessary for a total eclipse of moon. Show by a diagram the relative position of the s moon and earth, and the paths of the rays of light in a t eclipse of the moon.

9 Describe the planet Saturn as to *a*) physical conditi *b*) distance from the sun, *c*) rings, *d*) satellites.

10 Explain by aid of a diagram the apparent retrogr movements of a superior planet.

11 Distinguish between meteors and shooting-stars. S a theory to account for the origin of meteors.

12 Describe a method by which an observer may find latitude at sea.

13 Mention *three* equatorial constellations that rise in y longitude today between 6 p. m. and midnight. Describe of these constellations.

14 Mention and explain *three* corrections that must be m to find from its apparent place the true place of a star no the zenith.

15 Write an account of celestial photography, touching *a*) advantages, *b*) difficulties to be overcome, *c*) results obtai

High School Department

174TH EXAMINATION

ASTRONOMY

Thursday, June 19, 1902 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Mention important contributions to the science of astronomy by *each* of the following: Thales, Galileo, Sir William Herschel.

2 State Kepler's three laws of planetary motion.

3 State a theory to account for the maintenance of the sun's heat.

4 State which of the major planets has (*a*) the greatest size, (*b*) the least density, (*c*) the greatest eccentricity of orbit, (*d*) the most rapid rotation.

5 Mention *five* characteristics common to all planets.

6 Define nutation. State the cause of nutation.

7 State the cause of tides and explain the frequency of their occurrence.

8 Describe the planet Venus as to (*a*) size, (*b*) seasons, (*c*) telescopic features.

9 Explain why we do not see the same equatorial constellations at night throughout the year. Illustrate by diagram.

10 Mention *three* remarkable comets that have appeared during the past century and describe *one* of the comets mentioned.

11 Describe the physical constitution and the appearance of meteors. Give a theory to account for meteoric showers.

12 Mention *three* conditions that affect the apparent magnitude of a star. Mention *three* stars of the first magnitude and state the constellation in which each is found.

13 Describe the spectrum of *each* of the following: the sun, nebula. Explain in each case.

14 Describe a method by which an observer may find his longitude at sea.

15 Describe the construction and explain the use of the instrument known as the meridian-circle.

High School Department

171ST EXAMINATION

PHYSICS

Wednesday, September 25, 1901—9.15 a.m. to 12.15 p.m., only

Answer 10 questions but **no more**; *of these 10 questions at least five must be from part 1 in order to receive credit for part 1 and at least five from part 2 in order to receive credit for part 2. Answer 10 questions in all cases, whether credit is desired for either one of the two parts or for both parts. If more than 10 are answered only the first 10 answers will be considered. Give all computations in full. Do not reduce metric to other measures. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

Part 1 1 Mention and define *a*) *two* essential properties of matter, *b*) *three* specific properties of matter.

2 Two bodies weighing 360 and 225 pounds respectively have equal momenta. The velocity of the first body is 50 feet a second; find the velocity of the second body.

3 Describe each of the three classes of levers. Mention *one* example of each class.

4 Two parallel forces of 12 pounds and 16 pounds act in the same direction on a movable bar at points A and B respectively, 14 inches apart; find the magnitude and show by diagram the direction of the third force needed to maintain equilibrium.

5 A body is projected vertically upward with a velocity of 128.64 feet a second; find *a*) the hight to which the body rises, *b*) the velocity of the body at the end of two seconds.

6 Describe an experiment showing that air exerts a pressure equally in all directions.

7 A mass of copper weighs 2.86 kilograms in air, 2.53 kilograms in water and 2.56 kilograms in oil; find the specific gravity of *a*) the copper, *b*) the oil.

8 Account for the difference in temperature between the summit and the base of a high mountain.

9 Discuss the relative merits of hot water and steam for heating a public building.

10 A substance whose temperature is 90° C., when placed in an equal weight of water at 0° C., raises the temperature of the water to 6° C.; find the specific heat of the substance.

Part 2 11 Distinguish between the inclination or dip of the magnetic needle and the declination or variation of the magnetic needle. Account for each phenomenon.

12 Mention and illustrate *three* different methods of generating electricity.

13 Describe an experiment showing that a charge of electricity lies wholly on the outer surface of an electrified body.

14 Describe the construction and explain the operation of an electromagnet. Mention *one* important application of the electromagnet.

15 Describe the construction and explain the operation of some form of a secondary or storage battery.

16 Define and explain *each* of the following as applied to sound: pitch, intensity, timbre or quality.

17 The air column of an open organ-pipe vibrates 256 times a second; find the number of vibrations of the air column of a closed pipe of equal diameter and twice the length of the first pipe.

18 Describe the essential features and explain the operation of the phonograph.

19 Describe an experiment showing that light is propagated in straight lines.

20 What is spheric aberration? State how it may be prevented.

High School Department

172D EXAMINATION

PHYSICS

Wednesday, January 29, 1902 — 9.15 a. m. to 12.15 p. m., only

---

Answer 10 questions but **no more**; *of these 10 questions at least five must be from part 1 in order to receive credit for part 1 and at least five from part 2 in order to receive credit for part 2. Answer 10 questions in all cases, whether credit is desired for either one of the two parts or for both parts. If more than 10 are answered only the first 10 answers will be considered. Give all computations in full. Do not reduce metric to other measures. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

A laboratory course previously approved by the inspector, with notebook certified by the principal, may receive 20 credits toward the examination in which case only eight questions are to be answered, four from each part as above.

Part 1 1 Define *five* of the following: convection, potential energy, capillary attraction, coefficient of friction, dialysis, cohesion, indestructibility, specific heat.

2 Describe an experiment illustrating surface tension of liquids.

3 A ball is projected horizontally with a velocity of 35 feet a second from a point 144¼ feet above a level plain; find the horizontal distance that the ball will travel before striking the ground. [Make no allowances.]

4 Make a diagram of an arrangement of fixed and movable pulleys by means of which a weight of 5 pounds will balance one of 40 pounds. [Make no allowances.]

5 State Pascal's law. Mention and describe *one* practical application of the principles of Pascal's law.

6 Describe an experiment showing that the air has *a*) weight, *b*) elasticity.

7 Describe the construction and explain the operation of *one* of the following: Atwood's machine, condensing (bicycle) pump, Nicholson's hydrometer.

8 A mass of lead weighs 5.23 kilograms in air and 4.77 kilograms in water; find the volume and the density (specific gravity) of the lead.

9 State what is meant by the dew-point of a vapor. Explain the formation of dew on grass.

10 Describe a process of manufacturing ice on a commercial scale. Explain the principles involved.

Part 2 11 Describe a laboratory experiment showing the lines of force in a bar magnet. Show by diagram the magnet and the lines of force.

12 Describe a laboratory experiment illustrating electrostatic induction. Give a theory to account for electrostatic induction.

13 State what is meant by the resistance of an electric conductor. Give *two* laws governing the resistance of electric conductors.

14 Distinguish between *a*) primary electric currents and secondary electric currents, *b*) primary batteries and secondary batteries.

15 Describe and explain the operation of *one* of the following: electric bell, electric motor.

16 Describe a laboratory experiment showing that sound is not propagated in a vacuum.

17 A person firing a gun hears an echo of the report 3 seconds later; if the temperature is 15° C., what is the distance of the reflecting surface?

18 Give a theory to account for the production and transmission of light.

19 State and illustrate *two* laws that govern the refraction of light.

20 Define spectrum. State the conditions under which the following are produced: *a*) continuous spectra, *b*) bright-line spectra.

High School Department

173D EXAMINATION

PHYSICS

Monday, March 24, 1902 — 9.15 a. m. to 12.15 p. m., only

Answer 10 questions but **no more**; *of these 10 questions at least five must be from part 1 in order to receive credit for part 1 and at least five from part 2 in order to receive credit for part 2. Answer 10 questions in all cases, whether credit is desired for either one of the two parts or for both parts. If more than 10 are answered only the first 10 answers will be considered. Give all computations in full. Do not reduce metric to other measures. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

A laboratory course previously approved by the inspector, with notebook certified by the principal, may receive 20 credits toward the examination in which case only eight questions are to be answered, four from each part as above.

Part 1 1 Define *a*) physics, *b*) a physical change. Illustrate a physical change.

2 Describe a laboratory experiment showing that action and reaction are equal and in opposite directions.

3 Show by aid of a diagram the directions of two component forces whose resultant will cause a body to move in a circular path.

4 Find the momentum of a falling mass of 500 pounds that has fallen from a hight of 257.28 feet.

5 The length of an inclined plane is 13 feet and its hight is 5 feet; find what weight will be sustained on the plane by a power of 390 pounds acting parallel to *a*) the base, *b*) the plane.

6 A rectangular vessel 25 centimeters square and 15 centimeters deep is full of sulfuric acid; find the total pressure on the inside of the vessel. [Sp. gr. of sulfuric acid = 1.84.]

7 State the principle of Archimedes and describe a laboratory experiment illustrating it.

8 Describe the construction and explain the operation of a mercurial barometer. Explain the use of the barometer in foretelling the weather.

9 Define the boiling point of a liquid. Mention and explain *two* conditions that tend to change the boiling point of a liquid.

10 Explain the fact that large bodies of water tend to modify the climate of places in their vicinity.

Part 2 11 Define *five* of the following: ohm, real image, volt, irradiation, ampere, harmonics, watt.

12 Give a theory to account for terrestrial magnetism.

13 Mention *three* different kinds of voltaic cells. Describe *one* of the cells mentioned, stating all the substances used.

14 Define induced currents. Describe a laboratory experiment illustrating the production of induced currents.

15 Describe the construction and explain the operation of an arc electric light.

16 Define sound. Describe the transmission of sound through *a*) the air, *b*) solids.

17 Describe a laboratory experiment illustrating the formation of Chladni's figures.

18 Describe a process of finding the candle power of a given light.

19 Explain by use of a diagram the position and the relative size of the image of an object placed 2 feet from a plane mirror. State the number of images of an object that will be formed by placing two plane mirrors at an angle of 90°.

20 Explain by aid of a diagram the formation of *a*) the primary rainbow, *b*) the secondary rainbow.

University of the State of New York

High School Department

174TH EXAMINATION

PHYSICS

Wednesday, June 18, 1902 — 9.15 a. m. to 12.15 p. m., only

Answer 10 questions but **no more**; *of these 10 questions at least five must be from part 1 in order to receive credit for part 1 and at least five from part 2 in order to receive credit for part 2. Answer 10 questions in all cases, whether credit is desired for either one of the two parts or for both parts. If more than 10 are answered only the first 10 answers will be considered. Give all computations in full. Do not reduce metric to other measures. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

A laboratory course previously approved by the inspector, with notebook certified by the principal, may receive 20 credits toward the examination in which case only eight questions are to be answered, four from each part as above.

Part 1 1 Define *five* of the following: mechanics, vaporization, dyne, adhesion, latent heat, center of oscillation, impenetrability, molecular force.

2 State what is meant by conservation of energy and describe an experiment illustrating it.

3 State *two* laws of capillarity. Describe an experiment illustrating capillarity.

4 Mention the three kinds of equilibrium and state the conditions necessary to produce each.

5 Find the time of vibration of a pendulum 97¾ inches long. [Length of second's pendulum = 39.1 inches.]

6 A rigid bar 17 feet long is supported at its extremities A and B; suspended from the bar 5 feet from A is a weight of 144 pounds, and 7 feet from B a weight of 90 pounds. Find the weight resting on each point of support.

7 Explain by aid of a diagram the operation of an artesian well.

8 Compare the scale of a centigrade thermometer with that of a Fahrenheit thermometer. Convert −15° C. into the corresponding reading F.

9 Describe an experiment illustrating specific heat.

10 Describe the construction and explain the operation of the steam-chest, cylinder and piston of a high-pressure steam-engine.

Part 2 11 Define magnet. Give a theory to account for magnetic polarization.

12 Describe the effect of a voltaic current on a magnetic needle under two different conditions. Illustrate each by diagram.

13 Describe the construction and explain the operation of *one* of the following: Leyden jar, plate electric machine.

14 Account for the polarization of a voltaic cell and describe a method of preventing it.

15 Describe an experiment illustrating static electrification by induction.

16 Find the length of sound-waves propagated through air at a temperature of 20° C. by a tuning fork that vibrates 256 times a second.

17 Describe an experiment illustrating sympathetic vibrations.

18 Describe the construction and explain the operation of a phonograph.

19 State the velocity of light. Describe a method by which the velocity of light has been measured.

20 Describe some form of polariscope and state one of its practical uses.

High School Department

172D EXAMINATION

CHEMISTRY

Wednesday, January 29, 1902—9.15 a. m. to 12.15 p. m., only

Answer 10 questions but **no more**; *of these 10 questions at least five must be from part 1 in order to receive credit for part 1 and at least five from part 2 in order to receive credit for part 2. Answer 10 questions in all cases, whether credit is desired for either one of the two parts or for both parts. If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

A laboratory course previously approved by the inspector, with notebook certified by the principal, may receive 20 credits toward the examination in which case only eight questions are to be answered, four from each part as above.

Part 1

1 Define *five* of the following: valence, amalgam, atomic weight, precipitate, radical, isomerism, reaction.

2 Describe an experiment showing that chemical action is favored by light.

3 Mention the two gases of which air is chiefly composed and give their proportions by volume. Compare these gases as to physical and chemical properties.

4 Describe the preparation and give the formula of *one* bleaching agent. Explain the bleaching property of this agent.

5 Describe a process of manufacturing sulfuric acid on a commercial scale. State *two* important uses of sulfuric acid.

6 State the chemical changes that occur when mortar hardens. Write the principal reactions.

7 Describe a method of preparing hydrogen sulfid, writing reactions. State the physical and the chemical properties of hydrogen sulfid.

8 Describe a process of separating aluminum from one of its ores. State the physical and the chemical properties of aluminum.

9 Find the weight of zinc and of hydrochloric acid required to evolve by their reaction 10 grams of hydrogen. [Atomic weight of $Zn=65$, of $Cl=35.5$.]

10 Write the formula of *each* of the following: nitric acid, calcium sulfate, ammonium hydrate, potassium chlorate, sodium carbonate.

Part 2 11 Describe an experiment illustrating the use of carbon as a reducing agent.

12 Describe the preparation of carbon dioxid by the action of an acid on a carbonate and write the reaction. Give the physical and the chemical properties of carbon dioxid.

13 Compare, as to light and heat, the flame of a candle with that of burning hydrogen. Explain.

14 Describe the construction of the Davy (miner's) safety-lamp. Explain the principles involved.

15 Describe a laboratory experiment illustrating destructive distillation.

16 Compare ordinary phosphorus with its principal allotropic form as to physical and chemical properties. Mention *three* important compounds of phosphorus.

17 Describe a laboratory experiment illustrating the manufacture of hard soap. State the chemical changes.

18 Compare the product of the complete combustion of carbon bisulfid with the product of its combustion when a cool dish is held in its flame. Explain.

19 Give *two* important properties of arsenious oxid. Mention with uses *two* other compounds of arsenic.

20 Define and illustrate alcoholic fermentation. Mention conditions *a*) favorable to fermentation, *b*) unfavorable to fermentation.

High School Department

174TH EXAMINATION

CHEMISTRY

Wednesday, June 18, 1902 — 9.15 a. m. to 12.15 p. m., only

Answer 10 questions but no more; *of these 10 questions at least five must be from part 1 in order to receive credit for part 1 and at least five from part 2 in order to receive credit for part 2. Answer 10 questions in all cases, whether credit is desired for either one of the two parts or for both parts. If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

A laboratory course previously approved by the inspector, with notebook certified by the principal, may receive 20 credits toward the examination in which case only eight questions are to be answered, four from each part as above.

Part 1 1 Define *five* of the following: alkali, anhydrid, dibasic acid, positive element, saturated solution, triad, filtrate.

2 Describe an experiment showing that chemical action is favored by (*a*) heat, (*b*) solution.

3 Describe a method of preparing ozone. Compare the physical and chemical properties of ozone with those of oxygen.

4 Describe a method of purifying water other than by filtration.

5 Describe the usual method of preparing nitrous oxid. Mention the physical and the chemical properties of nitrous oxid.

6 Describe the preparation of sulfur dioxid by the action of a metal on sulfuric acid. Write the reaction.

7 State the physical and the chemical properties of sodium. Mention *three* important compounds of sodium.

8 Describe an experiment showing the affinity of chlorin for hydrogen.

9 Describe the construction and explain the operation of the oxyhydrogen blowpipe.

10 Describe the manufacture of steel by *one* of the following processes: Bessemer, cementation.

Part 2 11 Describe an experiment illustrating the power of charcoal to absorb gases.

12 Compare the affinity of charcoal for oxygen at ordinary temperatures and at high temperatures. Illustrate.

13 Compare, as to light and heat, the flame of coal-gas with that of water-gas. Explain.

14 Describe an experiment showing that expired air contains carbon dioxid. Write the reaction.

15 Explain the formation of carbon monoxid in coal fires. Compare the physical and the chemical properties of carbon monoxid with those of carbon dioxid.

16 Describe an experiment illustrating the affinity of phosphorus for oxygen. Mention and explain *one* important use of phosphorus.

17 Define nascent state. Describe an experiment illustrating the difference between the chemical energy of a gas in its nascent state and the chemical energy of the same gas in its ordinary state.

18 Compare the products of the complete combustion of hydrogen sulfid with the results of its combustion when a cool dish is held in the flame. Explain.

19 Describe the action of yeast in bread-making.

20 Write the formula of *each* of the following: phosphoric acid, arsenious oxid, alcohol (ethyl hydrate), marsh-gas (methane), grape-sugar.

High School Department

172D EXAMINATION

GEOLOGY

Friday, January 31, 1902 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Mention *five* groups of minerals and give an example of each group mentioned.

2 What is the special geologic significance of unconformable strata? Describe unconformable strata. Use a drawing to illustrate.

3 Describe the origin and growth of coal measures.

4 Account for the formation of *a*) beds of kaolin, *b*) beds of limestone.

5 Describe *two* kinds of fluviomarine formations.

6 Mention *five* effects of metamorphism.

7 Give *four* causes that may account for the spaces filled by veins.

8 Describe the action of *two* natural causes that effect changes of level on the earth's surface.

9 Describe dunes as to *a*) conditions most favorable to formation, *b*) kind of stratification.

10 Describe geologic features that you have observed during a class excursion.

11 Mention the principal geologic changes that occurred in North America at the close of the Lower Silurian era.

12 In what era did *each* of the following first appear: acrogens, gymnosperms, fishes, birds, mammals?

13 Give the principal characteristics of the Champlain period.

14 Mention the epochs of the Stone age and give the principal characteristic of each.

15 Mention *two* counties in New York state where graphite occurs; *two* where oil wells exist; *two* where gypsum quarries are found; *two* where garnets are found; *two* where iron ore is mined.

High School Department

174TH EXAMINATION

GEOLOGY

Friday, June 20, 1902 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Describe the origin, development and structure of (*a*) volcanic rocks, (*b*) plutonic rocks.

2 Describe *four* kinds of non-calcareous fragmental rock.

3 Mention the characteristics of *each* of the following: feldspar, sandstone, gneiss, graphite, magnetite.

4 Make a drawing showing the structure of *each* of the following: fault, anticline, ripple-marks, rill-marks, flow-and-plunge structure.

5 Describe the origin and development of a coral reef.

6 Compare the characteristics of Mount Vesuvius with those of the Hawaiian volcanoes. Account for the differences.

7 Describe the geologic effect of tidal currents.

8 State the geologic significance of fiords.

9 Give an account of observations made during a class excursion, illustrating (*a*) dynamic geology, (*b*) historical geology.

10 Explain the use of fossils in determining the age and location of strata.

11 Explain (*a*) why talus is not found at the base of cliffs in tropical countries, (*b*) why a geyser has a crater.

12 In what era did *each* of the following first appear: angiosperms, insects, brachiopods, amphibians, man?

13 Describe the drift as to (*a*) origin, (*b*) area.

14 Describe (*a*) the rocks of the Corniferous period, (*b*) the rocks of the Onondaga period.

15 Describe the progress of plant life through the successive geologic periods by mentioning the kinds of fossil plants found in the various formations.

High School Department

171ST EXAMINATION

PHYSICAL GEOGRAPHY

Thursday, September 26, 1901 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Define *five* of the following: glacier, parhelia, plain, acclimation, erosion, waterspout, lagoon.

2 Mention *three* prominent features in which the relief of North America resembles that of South America; *two* prominent features in which the relief of North America differs from that of South America.

3 Where does a degree of latitude have the greatest length? Why? Give in miles the approximate length of a degree of latitude.

4 Describe *four* principal forms of clouds.

5 Construct a diagram illustrative of the normal circulation of the winds.

6 Give *three* reasons why the heat from the sun's rays gradually diminishes from the equator to the poles.

7 What is meant by point of saturation of the atmosphere? Distinguish between actual humidity and relative humidity.

8 Describe the bed of the Indian ocean.

9 Why are irregularities of coast line desirable? Give *two* reasons.

10 Compare continental islands with oceanic islands as to *a*) size, *b*) characteristics. Mention *two* American continental island chains.

11 How does the hight of the snow-line of coast regions compare with the hight of the snow-line of interior regions in the same latitude? Explain.

12 Mention *five* large cities of the world through which isotherm 50° north passes. Account for its deviation from parallels of latitude.

13 Mention the characteristics of *each* of the three zones of animal life.

14 Mention *two* widely separated places in the same latitude where nearly opposite conditions of climate prevail at the same time. Explain.

15 Explain how the topography of New England has affected the development of manufacturing interests.

High School Department

172D EXAMINATION

PHYSICAL GEOGRAPHY

Thursday, January 30, 1902 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 At what times during the year are day and night of equal length over all the earth? Explain.

2 Describe the barometer. On what principle does the usefulness of the barometer depend?

3 Mention *four* principal causes on which climate depends. Explain *one* of them.

4 Describe the cumulus cloud as to *a*) cause, *b*) form, *c*) hight, *d*) time of occurrence.

5 How is the formation of dew affected by *a*) clouds, *b*) wind? Explain.

6 Describe the trade-winds as to *a*) cause, *b*) location, *c*) direction, *d*) beneficial results.

7 Give the principal cause of ocean currents. Mention the currents of the Atlantic.

8 Describe the origin and development of a longitudinal mountain valley. Give examples.

9 Describe in detail the physiographic features that you have observed during a class excursion.

10 Trace the course of isotherm 30° north across the earth and account for its deviation from parallels of latitude.

11 Describe the origin and development of an alluvial plain. Give examples.

12 Suggest an experiment to illustrate refraction of light. Explain.

13 Give the cause of the absence of rain in the Arabian desert.

14 Describe *two* kinds of volcanic eruptions and mention a volcano illustrative of each kind.

15 Show the effect of the Mohawk gap (pass) at Little Falls on the great development of New York city.

High School Department

173D EXAMINATION

PHYSICAL GEOGRAPHY

Tuesday, March 25, 1902 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Mention *five* proofs that the form of the earth is spheric.

2 Mention *four* gases that enter into the composition of air and state the principal function of each of *two* gases mentioned.

3 Through what large cities does isotherm 50° north pass? Account for its deviation from parallels of latitude.

4 Describe a physiographic feature that you have observed in your vicinity and show its relation to some industry.

5 Give the origin and development of a cyclone in the temperate zone.

6 Describe the prevailing westerlies as to *a*) cause, *b*) direction.

7 Describe the origin and development of a transverse mountain valley.

8 How is the bed of the Atlantic well adapted for the laying of oceanic cables?

9 What is meant by the crust of the earth? Mention *five* principal elements of the earth's crust.

10 Give the origin and development of a delta. Mention *four* noted deltas.

11 Describe the rainfall in the zone of calms.

12 Describe the origin and development of a typical volcano.

13 Compare the climate of San Francisco with that of Washington D. C. Account for the difference.

14 Assume that an area of low barometer is moving across the United States; state the probable weather conditions that will prevail along its course.

15 Explain how the topography of New York state has aided its industrial development.

High School Department

174TH EXAMINATION

PHYSICAL GEOGRAPHY

Thursday, June 19, 1902 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Give approximately (*a*) the diameter of the earth, (*b*) the circumference of the earth, (*c*) the area of the earth. How does the earth compare in size with the other planets?

2 State *two* principal hypotheses in regard to the present condition of the interior of the earth.

3 Mention *two* uses of dust in the atmosphere.

4 Give the cause of mountain breezes that occur (*a*) during the day, (*b*) during the night.

5 Mention the characteristics of (*a*) the upper course of rivers, (*b*) the middle course of rivers.

6 Describe the origin, development and effect of a waterspout.

7 Give the origin and development of (*a*) a coastal plain (*b*) an inland plain. Mention an example of each kind.

8 Give the life history of Great Salt lake.

9 Account for the formation of (*a*) an esker (kame), (*b*) a natural bridge similar to the one in Virginia.

10 Mention *five* principal causes of the depressions occupied by lakes.

11 Give the cause, origin and development of a Chinese typhoon.

12 Describe the Peruvian current. State the effect of this current on adjacent land.

13 Give the chief physiographic reasons that account in part for the location and growth of *each* of the following cities: Duluth, Toledo, Kansas City, Los Angeles, Carlsbad.

14–15 Construct a weather map showing the progress of a storm across the United States on two successive days. Indicate the lines of equal barometric pressure, the directions of the wind and the track of the storm center.

High School Department

171ST EXAMINATION

BOTANY

Tuesday, September 24, 1901 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Define *five* of the following: spadix, rhizome, macrospore, pollination, thallus, histology, vernation.

2 Describe the structure of the Indian corn seed. Use drawings to illustrate.

3 Describe the germination and early growth of the pine. Use drawings to illustrate.

4 Make a drawing of a vertical section of the flower of the toad-flax, showing the arrangement of the floral parts.

5 Describe the living parts of an exogenous tree.

6 What is meant by alternation of generations? Illustrate from the life history of a moss.

7 Mention *four* classes of dehiscent fruits and give an example of each class.

8 In kind of inflorescence and arrangement of floral parts how does the pea differ from the horse-chestnut?

9 Explain how the growth of the terminal bud influences *a*) the form of the tree, *b*) the manner in which the tree branches.

10 Compare the flower of the buttercup with the flower of the apple, indicating the relative position of the floral parts. Use drawings to illustrate.

11 Describe the characteristics of plants in desert regions that protect them from too rapid transpiration.

12 Suggest an experiment to discover the presence of proteid matter in seeds.

13 Describe by aid of drawings *two* plant tissues that you have examined with a compound microscope.

14 Give the fundamental characteristics that assign the strawberry, the rose and the cherry to the same family.

15 Suggest an experiment to show in what part of the root of a seedling the increase in length takes place.

High School Department

172D EXAMINATION

BOTANY

Tuesday, January 28,.1902 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

A laboratory course previously approved by the inspector, with notebook certified by the principal, may receive 20 credits toward the examination in which case only eight questions are to be answered.

1 Describe the germination and early growth of the bean, using drawings to illustrate at least *two* stages of its early growth.

2 Describe the form and state the function of *a*) primary roots, *b*) secondary roots, *c*) adventitious roots, *d*) aerial roots.

3 How are the winter buds of the horse-chestnut and of other plants protected from cold and wet weather?

4 Describe *a*) the inflorescence of Indian corn, *b*) the method of pollination of Indian corn.

5 Mention the *two* principal divisions of dicotyledonous plants. Give *a*) the leading characteristic of each division, *b*) a plant belonging to each division.

6 Suggest an experiment to demonstrate osmose. Of what use is osmose to plants? Illustrate.

7 Compare the white daisy with the morning-glory as to *a*) inflorescence, *b*) calyx, *c*) corolla, *d*) seed distribution.

8 Make a diagram of a cross-section of *one* of the following flowers: nasturtium, strawberry, buttercup.

9 State with reference to the nasturtium *a*) use of the spur, *b*) how self-pollination is prevented.

10 Draw and describe the fruit of *each* of the following: dandelion, maple, portulaca, elm, shepherd's purse.

11 Mention *two* kinds of natural defense that plants sometimes have against the attacks of animals. Give an example of each kind.

12 Describe *two* kinds of florets found on the blossom of the wild aster. What position in the scale of plant life does the family to which the aster belongs occupy?

13 Describe a flower that you have studied with reference to its adaptation for pollination by insects.

14 Suggest an experiment to demonstrate turgescence in plants.

15 Make a drawing of some low form of plant life that you have examined with a compound microscope. Under what conditions and where did this low form of plant grow?

High School Department

174TH EXAMINATION

BOTANY

Tuesday, June 17, 1902 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

A laboratory course previously approved by the inspector, with notebook certified by the principal, may receive 20 credits toward the examination in which case only eight questions are to be answered.

1 Describe the structure of the pea seed, indicating the various surface markings. Use drawings to illustrate.

2 Describe the process of germination of a monocotyledonous plant, using drawings to illustrate at least *two* stages of its early growth.

3 Suggest an experiment to demonstrate that oxygen is consumed during the germination of seeds.

4 Classify buds as to (*a*) position, (*b*) contents. Make a drawing of a longitudinal section of a typical bud.

5 Make a drawing of an apple twig, indicating the relative position of the leaf buds. What fraction indicates the arrangement?

6 State *three* methods employed by plants in climbing. Mention a plant illustrative of each method.

7 What is meant by transpiration? Mention the special organs of transpiration and state how transpiration benefits the plant.

8 Suggest an experiment to demonstrate in what part of the root of the seedling increase in length takes place.

9 Give arguments to prove that flowers are modified branches.

10 From observations made in the field during a class excursion describe the way by which some perfect flower prevents self-pollination.

11 Draw and describe the fruit of *each* of the following: buttercup, daisy, strawberry, violet, dentaria.

12 Describe (*a*) the inflorescence of the pine, (*b*) the method of pollination of the pine.

13 Compare the flower of the trillium or adder's tongue with that of the strawberry, indicating the position of the floral parts of each. Use drawings to illustrate.

14 Mention the principal divisions of phanerogams and give (*a*) a leading characteristic of each division, (*b*) a plant belonging to each division.

15 Describe by means of drawings *two* mounts of plant tissue that you have examined with a compound microscope.

High School Department

172D EXAMINATION

ZOOLOGY

Wednesday, January 29, 1902 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

A laboratory course previously approved by the inspector, with notebook certified by the principal, may receive 20 credits toward the examination in which case only eight questions are to be answered.

1 Mention *three* points of resemblance and *two* points of difference between plants and animals.

2 State with reference to the sponge *a*) kind of food, *b*) method of assimilation, *c*) manner of breathing, *d*) *one* way of reproduction.

3 From observations made while dissecting, describe the circulatory system of the earthworm. Make a drawing showing the arrangement of the principal organs of circulation.

4 Give the life history of a moth. In what stage and in what way are moths *a*) useful, *b*) injurious?

5 From observations made while dissecting, draw and describe the brain of a frog.

6 Draw and describe the ventral side of the abdomen of the crayfish.

7 From observations made while dissecting, describe the circulatory system of a fish. Make a diagram of the principal organs of the circulatory system of a fish.

8 Make a drawing of a beetle, indicating the external organs. Mention the order to which beetles belong and give leading characteristics of this order.

9 Describe the development and habits of the mussel. Mention *two* related forms.

10 Compare the following as to method of obtaining food: bee, grasshopper, butterfly, spider, fish.

11 How is *each* of the following specially adapted by structure to its environment: frog, fish?

12 Mention the principal points as determined by complexity of structure that assign the bird to a higher place in the scale of life than the frog; the frog to a higher place than the starfish.

13 Give *two* illustrations of communal life among animals. State the advantages of communal life to animals.

14 Trace the evolution of the digestive system by describing its phases as manifested in the amoeba, sponge, hydra, starfish and earthworm.

15 Draw and describe any animal that you studied while it was alive under the compound microscope.

High School Department

174TH EXAMINATION

ZOOLOGY

Wednesday, June 18, 1902 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

A laboratory course previously approved by the inspector, with notebook certified by the principal, may receive 20 credits toward the examination in which case only eight questions are to be answered.

1 With reference to an amoeba that you have studied, state (*a*) how studied, (*b*) habitat, (*c*) structure, (*d*) properties.

2 Make an enlarged drawing of a hind leg of a grasshopper, indicating each part.

3 From observations made in dissection, describe the various parts of a clam or of a mussel.

4 Give the life history of a frog. Make drawings illustrating at least *four* stages of the frog's development.

5 From observations made in dissection, describe the circulatory system of a frog. Make a drawing of the heart, indicating the parts.

6 Draw and describe the thoracic appendages of the crayfish.

7 From observations made in dissection, describe the digestive tract of a bird.

8 Mention the three kinds of individuals among honey-bees. Make a drawing of each kind.

9 Compare the grasshopper with the butterfly, mentioning *six* points of resemblance in structure and *two* points of difference in structure.

10 What parts in the butterfly are (*a*) analogous to the lungs of a bird, (*b*) homologous to the maxillae of a grasshopper?

11 Mention *five* characteristic points of resemblance and *five* points of difference existing between the frog and the turtle.

12 Describe the skeleton of a perch or of some other fish. Make a drawing of the skeleton described, indicating the parts.

13 Mention *five* fundamental points, as determined by increasing complexity of structure, that assign the fish to a higher place in the scale of life than the grasshopper; the cat to a higher place than the bird.

14 Trace the evolution of the respiratory system by describing its phases as manifested in the sponge, the starfish, the earthworm, the clam and the beetle.

15 Give *two* arguments that favor the theory of organic evolution.

High School Department

171ST EXAMINATION

PHYSIOLOGY AND HYGIENE

Wednesday, September 25, 1901 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Define *five* of the following: germ, anesthetic, ligature, duodenum, clavicle, metabolism.

2 Mention the bones of the cranium. Describe *two* bones of the cranium.

3 Give the function of tendons. How are tendons well adapted by structure to perform their function? Mention the strongest tendon of the body.

4 Mention the coats of the stomach. Describe *two* coats of the stomach.

5 Describe the process of digestion and absorption of a meal of bread and butter.

6 Give the location, structure and function of the pancreas.

7 State the effect of alcoholic drinks on the muscular tissue. Explain.

8 Describe the structure of the nose.

9 Describe the structure and state a function of the white blood-corpuscles.

10 State the effect on the system of *a*) cocain, *b*) chloroform.

11 Describe the structure and state the function of the diaphragm.

12 Mention an antidote for *a*) carbolic acid, *b*) Paris green.

13 Describe the structure of the spinal cord. Make a diagram of a transverse section of the spinal cord.

14 What is meant by sensation? Describe the distribution of the sensory nerves.

15 Suggest an experiment to demonstrate that pepsin and acid are necessary for the digestion of fibrin.

High School Department

172D EXAMINATION

PHYSIOLOGY AND HYGIENE

Wednesday, January 29, 1902 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Give the number and the names of the bones of *a*) the shoulder, *b*) the arm, *c*) the wrist, *d*) the hand.

2 Give the structure and the principal function of *a*) voluntary muscles, *b*) mucous membrane.

3 Give the structure and the function of *a*) the cutis, *b*) the cuticle.

4 Describe the arteries as to *a*) structure, *b*) function and action.

5 State the effect on the elasticity of the arteries of *a*) the occasional use of alcoholic drink, *b*) the habitual use of alcoholic drink.

6 Why is milk a perfect food for children? Mention the food substances in milk.

7 Describe the action of the heart in forcing the blood through its chambers.

8 Give the general anatomy of the lungs. Make a diagram of the lungs.

9 Describe the structure and state the functions of the medulla oblongata.

10 Mention some of the hereditary effects of excessive indulgence in stimulants and narcotics.

11 Describe the structure of the small intestine and show how it is well adapted by structure to perform its function.

12 What is meant by short-sightedness? Make a diagram showing the form of a short-sighted eye.

13 Describe the arrangement of the vocal cords. What is meant by change of voice?

14 Describe the healing of a cut. Why should a cut be covered with an antiseptic dressing?

15 Suggest an experiment to show that there is *a*) mineral matter in bone, *b*) animal matter in bone.

High School Department

173D EXAMINATION

PHYSIOLOGY AND HYGIENE

Monday, March 24, 1902 — 1.15 to 4.15 p. m., **only**

Answer 10 questions but no more. *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Give the number and the names of the bones of *a*) the pelvis, *b*) the leg, *c*) the foot.

2 State the effects of *a*) a hot bath, *b*) a cold bath. Discuss the time and manner of bathing.

3 Mention *three* methods of cooking meat and discuss the merits of each.

4 Describe the permanent set of teeth as to number and names. Show how each kind of teeth is adapted by structure to do the work required.

5 Describe the process of digestion, absorption and assimilation of the white of an egg.

6 Describe the valves of the heart as to *a*) kinds, *b*) structure, *c*) action.

7 State the effect of strong alcoholic drink on *a*) the gastric juice, *b*) the moisture in the tissues of the body.

8 Describe the lymph and its flow in the body. State the functions of the lymph nodes (glands).

9 State the effects of breathing impure air. Explain.

10 Describe the structure and state the functions of the cerebellum.

11 Give hygienic objections to the habit of *a*) smoking cigarettes, *b*) chewing tobacco.

12 Describe the structure of the middle ear.

13 Give directions for the immediate treatment of *a*) a fracture, *b*) sunstroke.

14 Suggest experiments to show that expired air is *a*) warm, *b*) moist.

15 State the relation of reflex action to *a*) digestion, *b*) heart action.

University of the State of New York

High School Department

174TH EXAMINATION

PHYSIOLOGY AND HYGIENE

Wednesday, June 18, 1902 — 1.15 to 4.15 p. m., **only**

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Define *five* of the following: auricle, hygiene, narcotic, enamel, villi, dialysis (osmosis), pepsin.

2 Describe the structure and state the function of involuntary muscles. Where are involuntary muscles chiefly found?

3 Describe the growth of (*a*) hair, (*b*) nails. State the function of each.

4 Discuss the relative value of the following as materials for clothing: cotton, wool, silk, fur.

5 Mention the essential elements of food. State the necessity of a mixed diet.

6 Mention *two* of the ferments of the pancreatic juice and state the special function of each.

7 State the effect of alcohol on (*a*) the moisture in the tissues of the body, (*b*) the nerves.

8 Give the general anatomy of the stomach.

9 Give the composition of teeth. Make a drawing of a vertical section of a tooth, designating the parts by name.

10 State the effect on the system of (*a*) nicotin, (*b*) opium

11 Trace the course of the blood circulation through the body, beginning at the left ventricle.

12 What is meant by longsightedness? Make a diagram showing the form and action of the eye in longsightedness.

13 Describe oxidation and state its effects on the system.

14 Describe the structure and state the function of the cerebrum.

15 What is meant by a disinfectant? Mention *two* disinfectants and state a method of using each.

High School Department

172D EXAMINATION

GEOGRAPHY

Thursday, January 30, 1902 — 1.15 to 4.15 p. m., only

Answer 10 questions but no more. *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Draw in outline the Atlantic coast of the United States.

2 On the map drawn in answer to question 1 show the location of *a*) Cape Cod, *b*) Long Island sound, *c*) Delaware bay, *d*) Cape Hatteras, *e*) Rhode Island, *f*) Georgia, *g*) Delaware, *h*) Connecticut, *i*) South Carolina, *j*) Virginia.

3 Mention *one* county of New York well-known for its production of fruit, *one* in which wheat-growing is an important industry, *one* in which lumbering is carried on extensively, *one* in which iron is mined, *one* in which dairying is an important industry.

4 Mention *five* of the native wild animals of New York state and describe *one* of them, touching on *a*) its home, *b*) its food, *c*) its habits of life, *d*) its benefits or injuries to man.

5 Mention the largest *five* cities in New York state and give *one* important fact concerning each city mentioned.

6 Mention in order the states that would be seen on the west bank of the Mississippi in going from St Paul to the Gulf of Mexico.

7 Mention *five* countries of South America and give with regard to each *a*) location, *b*) name and location of capital, *c*) form of government.

8 Describe *three* of the following: Columbia river, Puget sound, Pike's peak, Sierra Nevada mountains.

9 Mention *five* important rivers of British America and describe *one* of them.

10 Describe *five* of the following: Danube river, Strait of Gibraltar, Dardanelles, Corsica, Pyrenees mountains, Gulf of Finland, Volga river, Sicily.

11 Describe the production of each of *three* of the following: honey, cocoanuts, cork, olive oil, dates.

12 Describe *three* of the following: Nile river, African diamond fields, Kongo river, Madagascar, the Transvaal.

13 Give the name and location of *a*) *one* important river in Siberia, *b*) *two* important cities in China, *c*) *one* seaport of India, *d*) *one* important island in the Indian ocean.

14 Describe a route from New York to Manila and state approximately the time required to make the trip.

15 Explain why the days are shorter in winter than in summer. [Use diagram.]

High School Department

173D EXAMINATION

GEOGRAPHY

Tuesday, March 25, 1902 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Make a diagram of a hemisphere and on it show *five* important circles. Indicate the name and the location of each circle shown.

2 State the effect of the rotation of the earth on the direction of the trade winds. Illustrate.

3 Compare the climate of Oswego county, New York, with that of Hamilton county in nearly the same latitude. Give *two* reasons for the difference.

4 Mention a noteworthy event connected with each of *five* of the following: Saratoga, Tarrytown, Schenectady, Batavia, Oriskany, Newburg, White Plains.

5 Describe *one* of the following: *a*) a trip from Oswego to Albany, *b*) a trip from Binghamton to Buffalo. Mention the principal cities and towns and the important natural features that would be seen on the trip.

6 Describe the Eskimos, touching on *a*) houses, *b*) dress, *c*) food, *d*) occupations.

7 Describe the climate of Central America as to temperature and rainfall. Give reasons for this condition.

8 Give the location of each of *five* of the following and *one* noteworthy fact concerning each one selected: Annapolis, Key West, Gettysburg, Seattle, Galveston, Pittsburg, Salem.

9 Write brief descriptions of *two* of the following, mentioning place where produced and any interesting facts concerning growth and culture: pineapples, bananas, peanuts, rice.

10 Mention a boundary river between *a*) Maryland and Virginia, *b*) South Carolina and Georgia, *c*) Nebraska and Iowa, *d*) Washington and Oregon, *e*) California and Arizona.

11 Mention *three* countries of South America bordering on the Pacific ocean, *two* bordering on the Atlantic ocean. Give the capital of each.

12 Mention an important seaport of *a*) Ireland, *b*) Spain, *c*) India, *d*) Australia, *e*) South Africa.

13 Give the location of each of *five* of the following and *one* important fact concerning each one selected: Interlaken, Athens, Kongo, Madagascar, Celebes, New South Wales, Honolulu.

14 Mention *three* of the native wild animals of Africa and describe *one* of them, touching on *a*) place of abode, *b*) food, *c*) habits, *d*) use or danger to man.

15 Mention *two* important exports and *one* important import of China. State the kind of government in China.

High School Department

174TH EXAMINATION

GEOGRAPHY

Thursday, June 19, 1902 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Define *each* of the following and give an example of each: promontory, isthmus, river system, strait.

2 State approximately (*a*) the circumference of the earth, (*b*) the diameter of the earth, (*c*) the difference between the polar and the equatorial diameter.

3 Mention a case where climate is affected by (*a*) an ocean current, (*b*) a neighboring range of mountains. Explain in each case.

4 Mention an important fact connected with *each* of the following places in New York state: Kingston, Geneva, Utica, Potsdam, Cohoes.

5 Give the name and the location in New York state of *two* lowland regions, *two* highland regions and *one* mountain peak.

6 Give the location in New York state of (*a*) a granite quarry, (*b*) a limestone quarry, (*c*) an iron mine, (*d*) a sugar factory, (*e*) a salt factory.

7 Mention *five* rivers on the boundary between the United States and British America and state the direction in which each flows.

8 Give the location of *each* of the following and mention *one* important fact concerning each: Mount Washington, the Golden Gate, Baton Rouge, Santa Fé, Vicksburg.

9 Describe a railway route between Chicago and the Pacific coast. Mention all the states crossed by this route.

10 Mention *two* important lakes and *three* important rivers in British America and give the location of each.

11 Mention *three* countries of South America wholly in the torrid zone, *two* partly in the torrid zone and partly in the south temperate zone, *one* wholly in the south temperate zone.

12 Mention in order the waters that would be traversed in going from London to St Petersburg.

13 What and where is *each* of the following: Luzon, Novgorod, Bosporus, Sardinia, Loire?

14 What season of the year is it at Melbourne at Christmas? Explain.

15 Mention *two* animals that furnish the principal supply of ivory and state where each is found.

University of the State of New York

High School Department

172D EXAMINATION

GREEK HISTORY

[*With a short survey of ancient oriental nations*]

Tuesday, January 28, 1902—9.15 a. m. to 12.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Draw a map of the eastern half of the Mediterranean and its environs and on it show with name the location of *a*) Greece, *b*) Lydia, *c*) Phenicia, *d*) Egypt, *e*) Crete.

2 Describe the river Nile and show why Egypt has rightly been called "The gift of the Nile."

3 Give an account of *one* of the following: *a*) the royal library at Nineveh, *b*) the Assyrians as builders, *c*) the later Babylonian kingdom.

4 Give a summary of the conquests of Cyrus the Great.

5 Show how each of *five* of the following was related to the siege of Troy: Achilles, Aeneas, Agamemnon, Hector, Helen, Menelaus, Priam, Ulysses.

6 Explain the influence of the Greek games in promoting *a*) sculpture, *b*) literature, *c*) commerce, *d*) a feeling of race unity.

7 Define or explain *five* of the following: *a*) amphictyony, *b*) cleruchy, *c*) helot, *d*) Magna Graecia, *e*) ostracism, *f*) olympiad, *g*) tyranny.

8 Give an account of the expulsion of the tyrants from Athens (510 B. C.) and mention *two* important results.

9 Give an account of the first Persian invasion of Attica, covering *a*) causes, *b*) decisive battle, *c*) effects on the Athenians.

10 Describe by map or otherwise the fortifications of Athens as completed by Pericles. Mention *two* advantages secured by these fortifications.

11 Give an account of *two* events that show the unusually cruel character of the Peloponnesian war.

12 Write on *one* of the following: *a*) perils of the Sicilian Greeks after the defeat of the Athenian expedition, *b*) rule of Dionysius I.

13 Sketch the public career of Epaminondas.

14 Give an account of *one* of the following: *a*) the kingdom of the Seleucidae, *b*) Rome's treatment of the cities of the Achaean league and the results of this treatment.

15 Mention *five* noted Greek authors and write a brief note on each.

High School Department

174TH EXAMINATION

GREEK HISTORY

[*With a short survey of ancient oriental nations*]

Tuesday, June 17, 1902—9.15 a. m. to 12.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Mention *five* important divisions of the Aryan race and state which divisions of this race attained a high degree of civilization before the Christian era.

2 Write on *one* of the following: (*a*) the invasion of the Hyksos (Shepherd) kings and its results, (*b*) classes of society among the ancient Egyptians.

3 Give an account of Phenicia, covering (*a*) location, (*b*) principal cities, (*c*) principal industries.

4 Show what geographic feature or features of Greece favored the growth of (*a*) small states, (*b*) commerce and colonization.

5 Describe social life among the early Greeks as revealed by the Homeric poems, touching on (*a*) position of woman, (*b*) dignity of manual labor, (*c*) hospitality.

6 Describe the education of a Spartan boy.

7 Draw a map of Italy and Sicily and on it show, with name, the location of each of *three* important Greek colonies.

8 Write on *one* of the following: (*a*) *three* celebrated Greek tyrants, (*b*) the first public code of laws for Athens, (*c*) teachings of Pythagoras.

9 Arrange in chronologic order the following: (*a*) the disgrace of Miltiades, (*b*) the reforms of Cleisthenes, (*c*) the battle of Salamis, (*d*) the burning of Sardis by the Ionian Greeks, (*e*) the first expedition of Mardonius against Greece, (*f*) the battle of Plataea, (*g*) the banishment of Hippias, (*h*) the battle of Thermopylae, (*i*) the battle of Marathon, (*j*) the ostracism of Aristides.

10 Give an account of the Delian confederacy, covering (*a*) purpose, (*b*) nature, (*c*) overthrow.

11 Show briefly the connection with the Peloponnesian War of *each* of the following: (*a*) Pericles, (*b*) Alcibiades, (*c*) Demosthenes, (*d*) Cleon, (*e*) Brasidas.

12 Relate the circumstances that led to the Theban supremacy.

13 Show how the way for Alexander's conquests was prepared by *each* of the following: (*a*) the expedition of the 10,000 Greeks under Cyrus, (*b*) the Second Sacred War.

14 Sketch the life of Alexander the Great, covering at least *five* important points.

15 Write on *one* of the following: (*a*) slavery in Greece, (*b*) the Greek theater, (*c*) the Delphic oracle.

High School Department

171ST EXAMINATION

ROMAN HISTORY

Tuesday, September 24, 1901 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Show approximately the territory in Italy occupied by *each* of the following: *a*) Etruscans, *b*) Gauls, *c*) Greeks, *d*) Latins. Distinguish between Latins and Italians.

2 Give an account of the Roman family, touching on *a*) power of the father, *b*) household gods and worship, *c*) dependents, *d*) relation to the gens.

3 Write on the following: *a*) the Latin league, *b*) the origin of the three tribes of early Rome.

4 State what important rights the plebeians gained *a*) under the kings, *b*) by the first secession to the Sacred mount.

5 Mention *three* important wars waged by Rome in the conquest of Italy. Show by map or otherwise the extent of territory controlled by Rome at the beginning of the first Punic war.

6 Mention *three* important events of Hannibal's invasion of Italy and give an account of *one* of them.

7 Give somewhat in detail an account of *one* of the following and show its results: *a*) the agrarian law of Tiberius Gracchus, *b*) the corn law of Caius Gracchus.

8 Explain in regard to changes in the composition of the Roman army made by Caius Marius *a*) their nature, *b*) their dangerous tendency.

9 Sketch the life of Sulla, showing *a*) the events that brought him into notice, *b*) his public services, *c*) his method of overcoming opposition, *d*) the purpose of his reforms.

10 State the decisive result of *each* of the following battles: *a*) Pharsalus, *b*) Philippi, *c*) Actium. Give an account of *one* of these battles.

11 State by whom and under what circumstances each of *two* of the following was uttered:

a) "Another such victory and I shall be ruined," *b*) "The Teutones have got all the land they need on the other side of the Alps," *c*) "Carthage, I behold thy doom!"

12 Show how the Roman franchise was extended *a*) as a result of the social war, *b*) by Julius Caesar, *c*) by Caracalla.

13 Write biographic notes on *five* of the following: Agricola, Marcus Aurelius, Diocletian, Hadrian, Seneca, Titus, Trajan.

14 Write on *one* of the following: *a*) the origin and spread of Christianity in the Roman empire, *b*) the invasion of the Visigoths in the reign of Valens.

15 Give an account of the battle of Tours and state *a*) the immediate result, *b*) *two* remote results.

High School Department

172D EXAMINATION

ROMAN HISTORY

Monday, January 27, 1902 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Mention *two* races of Italy more civilized than the early Romans and show how Rome received benefit from each.

2 Describe a noted public work and a political reform that originated in the period of the kings.

3 State the cause and an important result of each of the first *two* secessions of the plebeians.

4 Give an account of *one* of the following: *a*) Gallic invasion (390 B. C.), *b*) Hamilcar Barca's hatred of Rome and its results.

5 Explain the nature of a Roman colony. Show the importance of a Roman colony in extending Roman power.

6 Trace the connection between the proscriptions of Sulla and the conspiracy of Catiline.

7 Outline the military career of Pompey.

8 Give an account of the conduct of Antony from the assassination of Julius Caesar to the formation of the second triumvirate.

9 Give an account of the measures taken by Augustus to *a*) hold popular favor, *b*) preserve order in Rome, *c*) purify religion.

10 Compare the government of a Roman province under the republic with its government under the empire.

11 Connect an important conquest with the reign of *each* of the following: *a*) Claudius, *b*) Vespasian, *c*) Trajan. Mention *two* public calamities in the reign of Marcus Aurelius.

12 Show on a map *a*) the course of the river Tiber between the Janiculum and the ancient city of Rome, *b*) the location of *each* of the following hills: Capitoline, Palatine, Quirinal.

13 Write biographic notes on *five* of the following: Aetius, Clovis, Constantine the Great, Charles Martel, Odoacer, Procopius, Theodosius the Great.

14 Give an account of the rise of Mohammedanism, touching on *a*) early life of Mohammed, *b*) principal teachings, *c*) method of propagation.

15 Explain the nature of the assistance given by *a*) the pope to Pepin the Short, *b*) Pepin the Short to the pope.

High School Department

174TH EXAMINATION

ROMAN HISTORY

Monday, June 16, 1902 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Draw a map of Italy and on it show, with name, the location of *each* of the following: (*a*) Po, (*b*) Tiber, (*c*) Metaurus, (*d*) Rubicon.

2 State approximately the duration of kingly rule in Rome. Give a tradition relating to one of the Tarquins.

3 State the conditions that first led to the appointment of decemvirs.

4 Arrange in chronologic order the following: (*a*) sack of Rome by the Gauls (390 B. C.), (*b*) war with Pyrrhus, (*c*) capture of Veii, (*d*) Samnite wars. State *one* important result of each.

5 Write on *one* of the following: (*a*) victories and disasters of the Roman navy in the First Punic War, (*b*) why Hannibal failed to conquer Italy.

6 Mention *five* accessions to Roman territory that resulted directly or indirectly from the Punic wars.

7 Describe briefly the political and economic results of foreign conquests (264–133 B. C.), touching on *three* of the following: (*a*) growth of slavery, (*b*) disposition of the public lands, (*c*) impoverishment of small farmers, (*d*) increase of wealth, (*e*) new classification of society.

8 Give an account of *one* of the following: (*a*) the war with Jugurtha, (*b*) the proscriptions of Sulla.

9 Compare Julius Caesar with Pompey, touching on (*a*) military successes, (*b*) political sympathies, (*c*) mental ability.

10 Give an account of the assassination of Caesar, covering (*a*) causes, (*b*) immediate results.

11 Write on *one* of the following: (*a*) the formation of the second triumvirate, (*b*) the death of Cicero, (*c*) the origin and influence of the pretorian guard.

12 Describe *two* measures employed by the emperor Tiberius to maintain absolute power.

13 State the policy in regard to the boundaries of the empire of *each* of the following: (*a*) Augustus, (*b*) Trajan, (*c*) Hadrian.

14 Show why the emperor Julian was called the Apostate.

15 Write biographic notes on *five* of the following: Abd-er-Rahman, Alaric, Arminius, Attila, Caractacus, Genseric, Odoacer.

High School Department

172D EXAMINATION

MEDIEVAL HISTORY

Friday, January 31, 1902—9.15 a. m. to 12.15 p. m., only

Answer eight questions but **no more.** *If more than eight are answered only the first eight answers will be considered. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

1 Give an account of the kingdom of the Ostrogoths in Italy, covering *a*) origin, *b*) nature and extent of Theodoric's rule, *c*) overthrow.

2 Write on *two* of the following: *a*) the military and the commercial advantages of the site of Constantinople, *b*) the church of St Sophia, *c*) Justinian's wars, *d*) the fortifications of Constantinople.

3 Explain the nature of the services rendered by the monasteries in *a*) education, *b*) agriculture, *c*) philanthropic work, *d*) preservation of ancient learning.

4 Mention *five* countries in which the Northmen settled between 800 and 1100 A. D. Give an account of *two* settlements made by the Northmen.

5 Compare by map or otherwise the domains ruled by Henry 2 of England and Philip 2 of France. Explain the measures taken by Philip 2 to weaken England's power.

6 Sketch the lives of *two* of the following: Roger Bacon, Chaucer, Erasmus, Michelangelo, Marco Polo.

7 Explain the effect of *a*) the crusades on commerce, *b*) commerce on the use of money, *c*) the use of money on the relations between baron and serf, *d*) the use of money on the relations between baron and king.

8 Define or explain *six* of the following: astrology, constitutions of Clarendon, curfew, Danelagh, Field of May, janizary, Jacquerie, minnesinger, truce of God, tournament.

9 Write on *two* of the following topics relating to the Plantagenet period: *a*) the services of Simon de Montfort, *b*) the conquests of Edward 1, *c*) the coming of the Flemish weavers and its results.

10 Give an account of the Holy Roman empire as regards *a*) origin, *b*) disposition under the treaty of Verdun, *c*) revival under Otto 1, *d*) influence on Italy and Germany.

11 Give an account of the Ottomans in Europe, touching on *a*) early conquests, *b*) battles of Nicopolis and Angora and the results of each, *c*) capture of Constantinople.

12 State in regard to the wars of the roses *a*) the cause, *b*) the approximate duration, *c*) the effect on the nobility, *d*) the effects on national progress.

High School Department

174TH EXAMINATION

MEDIEVAL HISTORY

Friday, June 20, 1902—9.15 a. m. to 12.15 p. m., only

Answer eight questions but **no more.** *If more than eight are answered only the first eight answers will be considered. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

1 Describe the Teutons, covering (*a*) personal appearance, (*b*) *three* prominent traits of character.

2 Give an account of the kingdom of the Franks, touching on (*a*) origin, (*b*) weakness of the Merovingians, (*c*) services of Charles Martel, (*d*) accession of Pepin.

3 Write on *two* of the following: (*a*) introduction of silk culture, (*b*) the schools of Charlemagne, (*c*) the treaty of Verdun.

4 Show the importance to Europe of the *Corpus Juris Civilis* (codification of Roman laws). By whose command and under whose direction was this codification made?

5 Show how the power of the church was manifested in (*a*) the conduct of Alaric during the sack of Rome, (*b*) the influence of Leo 1 on Attila and Genseric, (*c*) the humiliation of Henry 4 of Germany at the castle of Canossa.

6 Give a summary of the conquests of Mohammedanism in the first century of its existence.

7 Give an account of the reign of John of England, covering his quarrel with (*a*) Philip 2 of France, (*b*) the church, (*c*) his barons. State an important result of each quarrel.

8 Describe the training of a boy for knighthood.

9 Write biographic notes on *five* of the following: Albertus Magnus, Dante, Lorenzo de'Medici, Petrarch, Rabelais, Raphael, Wyclif.

10 Show how Louis 11 strengthened France by (*a*) an increase of territory, (*b*) his domestic and foreign policy.

11 Write on *one* of the following: (*a*) the invasion of Italy by Charles 8 and its results, (*b*) changes in military organization due to the use of gunpowder.

12 Mention *three* events of the 15th century that greatly stimulated the intellectual life of Europe. Give an account of *one* event mentioned.

High School Department

171ST EXAMINATION

ENGLISH HISTORY

Thursday, September 26, 1901 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Draw a map of England and Wales and on it show, with name, the location of *a*) Canterbury, *b*) Dover, *c*) Pevensey, *d*) Runnymede, *e*) York.

2 Write on *one* of the following topics relating to the early history of Britain: *a*) the visit and report of Pytheas, *b*) Caesar's invasions.

3 Show in regard to the Saxon conquest of Britain, *a*) approximate date, *b*) cause, *c*) fate of the native Britons.

4 Explain *three* effective measures adopted by William 1 to strengthen the royal power.

5 Write somewhat in detail on *one* of the following: *a*) results of the Norman conquest, *b*) reign of Henry 1.

6 Describe the dangers from feudalism that appeared in the reign of Stephen.

7 What were the crusades? Mention *a*) an English king who became a crusader, *b*) *two* benefits derived from the crusades.

8 Describe the feudal system. How was feudalism in England affected by *a*) the battle of Crécy, *b*) the wars of the roses, *c*) the increase of commerce and manufactures?

9 Mention the contending parties in each of *three* of the following battles: *a*) Senlac, *b*) Evesham, *c*) Bannockburn, *d*) Bosworth, *e*) Flodden. Give an important result of each battle selected.

10 Write on *two* of the following: *a*) Perkin Warbeck's insurrection, *b*) fall of Cardinal Wolsey, *c*) suppression of the monasteries.

11 Give an account of *two* of the following matters relating to the reign of Elizabeth: *a*) religious differences among the English people, *b*) peace policy of the queen, *c*) treatment of Mary Queen of Scots.

12 State the circumstances that led the English people to invite William and Mary to the throne.

13 Mention *two* great wars in which England was engaged during the reign of George 3, and state in regard to each *a*) the cause, *b*) important results.

14 Write on *two* of the following: *a*) the Crimean war, *b*) the Berlin treaty (1878), *c*) the growth of Australia, *d*) the Jameson raid and its results.

15 Write biographic notes on *five* of the following: Geoffrey Chaucer, Sir Humphrey Gilbert, John Knox, Stephen Langton, Robert 2 (Duke of Normandy), Wat Tyler, Sir William Wallace.

University of the State of New York

High School Department

172D EXAMINATION

ENGLISH HISTORY

Thursday, January 30, 1902—1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Give *two* reasons why the study of English history is specially important to American students.

2 Describe the manner of life of the Britons at the time of Caesar's invasions, touching on *a*) clothing, *b*) dwellings, *c*) industries, *d*) government.

3 Write on *two* of the following topics relating to the Roman occupation of Britain: *a*) destruction of druidism, *b*) treatment of the Britons, *c*) Roman relics.

4 Show by map or otherwise the approximate location of conquests made by *a*) the Jutes, *b*) the Angles, *c*) the Saxons.

5 Mention the principal classes of society among the Saxons before the Norman invasion. Define hundred, shire, tun (town).

6 Illustrate, by mention of *two* incidents or events, *each* of the following traits of William 1: *a*) sagacity, *b*) cruelty.

7 Give an account of *two* measures taken by Henry 2 to weaken the power of the barons.

8 Mention *three* civil wars in which England has engaged since the Norman conquest and state the cause and an important result of each.

9 Show how *a*) the title "Defender of the Faith" came to be applied to the rulers of England, *b*) the church of England was separated from the papacy.

10 State the difference of opinion between James 1 and parliament in regard to *two* of the following: *a*) the 30 years war, *b*) the Spanish courtship, *c*) the levying of taxes.

11 Mention *three* parliamentary powers that became firmly established during the Stuart period.

12 Show how each of *three* of the following was acquired: New Zealand, Cape Colony, Gibraltar, Jamaica, Cyprus.

13 State facts to explain the following: "The Crimean war . . . may seem only to have postponed . . . the fall of a doomed and outworn power."

14 Sketch the life of Arthur Wellesley, Duke of Wellington, touching on *a*) early military career, *b*) part in the Napoleonic wars, *c*) attitude toward catholic emancipation and suffrage reform.

15 Mention the queens who have ruled England as sovereigns in their own right. Which of the queens mentioned is entitled to most credit as a ruler? Give reasons.

High School Department

173D EXAMINATION

ENGLISH HISTORY

Tuesday, March 25, 1902 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Draw a map of England and Wales and on it show the location, with name, of *a*) London, *b*) Liverpool, *c*) Southampton, *d*) the Severn, *e*) the Mersey.

2 Write somewhat in detail on *one* of the following: *a*) druidism, *b*) the earliest known accounts of Britain.

3 Connect each of *five* of the following with the Roman occupation of Britain: Agricola, St Alban, Boadicea, Caractacus, Claudius, Constantine, Hadrian, Vortigern.

4 What progress toward Saxon unity resulted from *a*) the council of Whitby, *b*) the rule of Egbert, *c*) the rule of Alfred?

5 Write on *one* of the following: *a*) Saxon manners and customs, *b*) conditions in Saxon England that favored a growth of feudalism, *c*) the Danish invasions.

6 Mention and explain *three* distinct advantages to England that resulted from the Norman conquest.

7 Mention in order the different dynasties (families of sovereigns) that ruled England from the Norman conquest to the accession of Henry 7. Give approximately the length of each dynastic period mentioned.

8 Give an account of the reign of Edward 1 as regards *a*) conquests, *b*) gains for constitutional liberty.

9 Show how Henry 7 strengthened the power of the throne by *a*) an improvement in the art of war, *b*) legal devices.

10 State the general policy of the Tudor sovereigns in regard to foreign wars, showing *a*) reasons for adoption, *b*) results.

11 Mention *three* events that may be regarded as causes of the civil war in the reign of Charles 1. Give an account of *one* of the events mentioned.

12 Write on *one* of the following topics: *a*) colonization as affected by the disorders of the Stuart period, *b*) the beginning of the present form of cabinet government, *c*) the moral condition of England under the Georges.

13 Describe England's colonial policy in the 18th century and state important results.

14 Show how England became involved in the Napoleonic wars and mention *two* important victories won by England in these wars.

15 Mention *two* important political reforms and *two* important wars of Victoria's reign. Give an account of *one* of the reforms mentioned.

High School Department

174TH EXAMINATION

ENGLISH HISTORY

Thursday, June 19, 1902—1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Describe *two* of the following geographic characteristics of England: (*a*) harbors, (*b*) watercourses, (*c*) insular position, (*d*) climate. Show how each characteristic described has been an advantage or a disadvantage.

2 Give an account of the Britons of the first century B. C. noting their attainments in (*a*) use of metals, (*b*) domestication of animals, (*c*) agriculture, (*d*) arts.

3 Give an account of Julius Caesar's invasions of Britain.

4 Write biographic notes on *five* of the following: Ethelred the Unready, Caedmon, Dunstan, Egbert, Guthrum, Hengist, Saint Augustine, Sweyn.

5 Show by map or otherwise the general divisions of England made (*a*) according to the treaty of Wedmore, (*b*) by Canute.

6 Mention *three* important events connected with the reign of William 1 and give an account of *one* of them.

7 Write on *one* of the following: (*a*) the charter of Henry 1, (*b*) the quarrel of Henry 2 and Thomas à Becket.

8 Give an account of *one* of the following: (*a*) John's loss of Normandy and its results, (*b*) the services of Stephen Langton.

9 Give an account of the English House of Commons, showing (*a*) origin, (*b*) separation from the House of Lords, (*c*) increased importance since 1832.

10 Summarize the principal religious changes of the Tudor period.

11 Compare the methods by which Charles 1 and George 3 sought to maintain arbitrary power.

12 Write on *two* of the following: (*a*) the political union of England and Scotland, (*b*) the South Sea Bubble, (*c*) the Young Pretender.

13 Give an account of the industrial changes in England resulting from the use of steam-power.

14 State (*a*) *three* principles for which the chartists contended, (*b*) *two* important results of the chartist agitation.

15 Mention, as notably connected with Victoria's reign, (*a*) *two* statesmen, (*b*) *two* men of letters, (*c*) *one* scientist. Write biographic notes on each one mentioned.

High School Department

171ST EXAMINATION

ELEMENTARY UNITED STATES HISTORY AND CIVICS

Wednesday, September 25, 1901—9.15 a.m. to 12.15 p.m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Explain why the invention of the mariner's compass aided the discovery and exploration of the new world.

2 Give an account of the settlement of New York by the Dutch, covering *a*) the purpose of the first settlers, *b*) the location of the first *two* settlements, *c*) the introduction of the patroon system.

3 Give an account of the settlement of *one* of the following: *a*) Rhode Island, *b*) Kentucky.

4 Write on *one* of the following connected with the French and Indian wars: *a*) the attack on Schenectady, *b*) the first capture of Louisburg, *c*) the Albany congress (1754).

5 Mention *a*) *two* colleges in the United States that were founded before the revolution, giving the location of each, *b*) a colony that established elementary schools by law.

6 What was the stamp act (1765)? Explain why the repeal of the stamp act did not pacify the colonists.

7 Write on *one* of the following: *a*) the battle of Long Island and its results, *b*) Arnold's treason.

8 Give an account of the boyhood and youthful training of George Washington.

9 Mention the first *five* presidents of the United States and connect an important event with the administration of each.

10 Show why the admission of Missouri caused dispute. State the terms of the Missouri compromise.

11 Show the importance in the civil war of *two* of the following: *a*) the capture of forts Henry and Donelson, *b*) the battle of Antietam, *c*) the emancipation proclamation, *d*) the capture of Atlanta.

12 Mention the territorial gains made by the United States since the civil war and state how each was acquired.

13 Write biographic notes on *five* of the following: Samuel Adams, Ethan Allen, Alexander Graham Bell, General Braddock, Nathan Hale, Francis S. Key, Dred Scott, Harriet Beecher Stowe.

14 What department of government has charge of the United States census? How often and for what purposes is the United States census taken?

15 State the qualifications for the presidency of the United States as regards *a*) age, *b*) birth, *c*) residence.

High School Department

172D EXAMINATION

ELEMENTARY UNITED STATES HISTORY AND CIVICS

Wednesday, January 29, 1902—9.15 a. m. to 12.15 p. m., only

Answer 10 questions but no more. *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Give an account of the first voyage of Columbus to America, covering *a*) purpose, *b*) discouragements, *c*) results.

2 Give a brief account of the discovery of *two* of the following: *a*) Florida, *b*) the Mississippi, *c*) the St Lawrence.

3 Show how New York came into the possession of the English.

4 Describe the difficulties and perils of the early settlers of *one* of the following: Jamestown, Plymouth.

5 Show *a*) how negro slavery began in the colonies, *b*) why slavery increased more rapidly in the south than in the north.

6 Draw a map of that section of New York most exposed to invasion during the French and Indian wars and on it give the location, with name, of each of *two* important forts.

7 Define or explain *two* of the following: *a*) writs of assistance, *b*) declaratory act, *c*) committees of correspondence, *d*) Boston port bill.

8 Mention, as notably connected with the revolution, *a*) *two* political leaders, *b*) *three* American generals, *c*) *one* English statesman who favored the colonists, *d*) *two* foreigners who gave substantial aid, *e*) *one* naval commander, *f*) *one* financier.

9 What event forced England to grant independence to the colonies? State the boundaries of the United States as fixed by the treaty of 1783.

10 Mention the important wars in which the United States engaged between 1783 and 1860. Give the general cause and *one* important result of each war.

11 State the circumstances that led to the annexation of each of *two* of the following: *a*) Florida, *b*) Texas, *c*) Hawaii.

12 Write on *two* of the following: *a*) the battle of Gettysburg, *b*) Lincoln's assassination, *c*) results of the civil war.

13 Compare the methods of travel and transportation in colonial days with those of the present time.

14 Who has power under the constitution to *a*) command the army and navy, *b*) admit new states, *c*) make treaties, *d*) declare war? Distinguish between congress and the house of representatives.

15 Mention *three* things that the constitution forbids states to do. Give a reason for *one* of these prohibitions.

High School Department

173D EXAMINATION

ELEMENTARY UNITED STATES HISTORY AND CIVICS

Monday, March 24, 1902—9.15 a. m. to 12.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 What was generally believed before the discovery of America in regard to *a*) the shape of the earth, *b*) the size of the earth? Show how *one* of these beliefs was a hindrance to Columbus.

2 Draw a map of New York state and on it show, with name, the location of *two* Dutch settlements.

3 State how *two* of the following aided the settlement of the American colonies: *a*) John Winthrop, *b*) Cecil Calvert (Lord Baltimore), *c*) William Penn, *d*) James Oglethorpe.

4 Write on *one* of the following topics: *a*) the purchase of Manhattan island, *b*) the troubles of Peter Stuyvesant.

5 State *one* frequent cause of trouble between the English colonists and the Indians. Why were the Indians of central New York hostile to the French?

6 Give an account of a public service rendered by Benjamin Franklin *a*) before the revolution, *b*) during the revolution, *c*) after the revolution.

7 Arrange in the order of occurrence the following: *a*) battle of Lexington, *b*) stamp act, *c*) Boston port bill, *d*) Boston tea-party, *e*) battle of Long Island.

8 Distinguish between battle and campaign. Mention *three* campaigns of the revolution and an important result of each.

9 Mention and explain *two* benefits derived from the adoption of the constitution of the United States.

10 Relate the circumstances that led to the purchase of Louisiana.

11 State in regard to the Erie canal *a*) its purpose, *b*) its chief promoter, *c*) its benefits to New York state and the west.

12 Mention an important event of Jackson's administrations. Show the importance of the event mentioned.

13 Write on *two* of the following: *a*) the emancipation proclamation, *b*) the Haymarket riot in Chicago, *c*) the assassination of President McKinley.

14 Show how *each* of the following is chosen and state the term of office of each: *a*) United States senator, *b*) member of the house of representatives.

15 Mention the department, executive, legislative or judicial, which has charge of *each* of the following: *a*) selection of postmasters, *b*) levying taxes, *c*) trials for treason, *d*) pardons for offenses against the United States, *e*) fixing a standard of weights and measures.

University of the State of New York

High School Department

174TH EXAMINATION

ELEMENTARY UNITED STATES HISTORY AND CIVICS

Wednesday, June 18, 1902—9.15 a. m. to 12.15 p. m., or

Answer 10 questions but **no more.** *If more than 10 are answered the first 10 answers will be considered. Each complete answer receive 10 credits. Papers entitled to 75 or more credits will be accep*

1 Write biographic notes on *five* of the following: Ch plain, Coronado, Cortez, Sir Francis Drake, La Salle, Ma lan, Verrazano.

2 Mention *three* European nations that made settlements North America and give the location of the first perman settlement made by each.

3 Describe the settlement of *one* of the following: (*a*) Pe sylvania, (*b*) Rhode Island, (*c*) Georgia.

4 Give an account of *two* instances in which early sett were greatly aided by the Indians.

5 Describe by drawing or otherwise *two* of the followi (*a*) blockhouse, (*b*) spinning-wheel, (*c*) colonial firepl (*d*) snow-shoe.

6 Mention *three* events that may be regarded as cause the Revolution. Give an account of *one* event mentioned.

7 Write on *two* of the following topics relating to the Re lution: (*a*) the capture of Ticonderoga, (*b*) the death of Nat Hale, (*c*) the burning of Kingston.

8 Show how the surrender of Burgoyne was connected w (*a*) the battle of Bennington, (*b*) the battle of Oriskany.

9 What departments of government established by Constitution were not provided for in the Articles of Confed tion? Why were these departments found necessary?

10 Mention an important event in the administration of e of the following: (*a*) Jefferson, (*b*) Monroe, (*c*) John Qui Adams. Show the importance of *one* event mentioned.

11 Mention the American who is entitled to most credit *each* of the following: (*a*) steamboat, (*b*) sewing-machi (*c*) telegraph, (*d*) Atlantic cable, (*e*) telephone.

12 Give an account of Sherman's march to the sea, cover (*a*) purpose, (*b*) route chosen, (*c*) *three* important results.

13 Relate important circumstances that led to the rec war with Spain.

14 Sketch the life of *one* of the following: De Witt Clint Ulysses S. Grant, William McKinley.

15 What is a veto? How may a bill that has been vet become a law?

High School Department

171ST EXAMINATION

ADVANCED UNITED STATES HISTORY

Thursday, September 26, 1901—9.15 a. m. to 12.15 p. m., only

Answer eight questions but **no more.** *If more than eight are answered only the first eight answers will be considered. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

1 Compare the climate of England with that of New England in *a*) summer, *b*) winter. Show why the settlement of the New England coast was retarded through ignorance of climatic conditions.

2 Give an account of the early history of New York, covering *a*) relative merits of the English and Dutch claims, *b*) extent of territory claimed by the Dutch, *c*) characteristics of the Dutch rule, *d*) Indian troubles, *e*) transfer to the English.

3 Cite facts to justify the following *five* italicized phrases by which Parkman has characterized the condition of the English colonies in the middle of the 18th century:

"*Divided in government; divided in origin, feelings, and principles; jealous of each other, jealous of the Crown; the people at war with the executive,* and, by the fermentation of internal politics blinded to an outward danger that seemed remote and vague,—such were the conditions under which the British colonies drifted into a war that was to decide the fate of the continent."

4 Give an account of *four* methods adopted by the colonists to resist the stamp act and classify each as legal or illegal. Were the legal or the illegal methods the more effective? Give reasons.

5 Show how the surrender of Burgoyne affected *a*) the attitude of England, *b*) the attitude of France, *c*) the loyalty of New York, *d*) the American army. Compare as regards military purpose Burgoyne's campaign with Sherman's march to the sea.

6 Describe the government of the state of New York under the constitution of 1777 as regards *a*) the legislative, executive and judicial departments, *b*) the council of appointment, *c*) the council of revision, *d*) the restriction of the franchise.

7 Show in detail why New England in the war of 1812 *a*) escaped serious invasion, *b*) suffered severe losses, *c*) incurred political odium.

8 Mention the states that laid claim to portions of the northwest territory at the close of the revolution and show how the conflicting claims were settled. Mention the divisions that have been made of the territory of Virginia since 1790 and give an account of *one* of them.

9 State the substance of the Monroe doctrine. Give an account of the political events in Europe and America that called forth President Monroe's proclamation. Give argument for or against the proposition that the United States violated the spirit of the Monroe doctrine in the Spanish-American war.

10 "The Missouri compromise quieted the slavery question for a while; but *other questions* coming up between 1820 and 1830 brought about a new division of parties."

State *two* "other questions" that divided parties between 1820 and 1830. Mention the leading parties that were formed in the administration of John Quincy Adams and the attitude of each toward the questions stated.

11 What authority over territories is given to congress by the constitution? Describe the usual form of organized territorial government as regards *a*) the legislative, executive and judicial departments, *b*) representation in the national congress. Show whether there is any constitutional reason for establishing the usual form of territorial government in Porto Rico and the Philippines.

12 Show *a*) why specie went out of circulation during the civil war, *b*) how wages and prices were affected by the issue of the United States treasury notes in 1862. Why did the value of the treasury notes vary with the fortunes of war?

High School Department

172D EXAMINATION

ADVANCED UNITED STATES HISTORY

Thursday, January 30, 1902—9.15 a. m. to 12.15 p. m., only

Answer eight questions but **no more.** *If more than eight are answered only the first eight answers will be considered. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

1 Show how the great lakes have facilitated *a*) exploration, *b*) settlement, *c*) industrial growth of the west, *d*) commercial development of the east. Compare the annual tonnage of the Sault Sainte Marie canal with that of the Suez canal.

2 Show in regard to the Iroquois *a*) extent of their authority, *b*) reasons for their ascendancy over other Indian tribes, *c*) circumstances that led to their alliance with the English, *d*) effects of their alliance on subsequent ownership of New York.

3 Give an account of the Virginia colony under Charles 2, touching on *a*) treatment by the king, *b*) troubles with the Indians, *c*) Bacon's rebellion and its results.

4 State in regard to the settlement of Georgia *a*) *three* motives of its founder, *b*) *two* causes of dissatisfaction among its early settlers.

5 Write on *two* of the following topics relating to the last French and Indian war: *a*) capture of Fort Niagara and its results, *b*) Abercrombie and Amherst in the Champlain valley, *c*) services of Sir William Johnson.

6 Give argument for or against the following: "With the triumph of Wolfe on the hights of Abraham began the history of the United States."

7 Give a detailed account of *three* conditions or events that justify the historian in calling the interval 1783–89 "the critical period of American history."

8 Mention *two* measures of Washington's first administration that caused sharp division of opinion in the cabinet and among the people. What political parties grew out of this division and what principles were maintained by each party?

9 State in regard to the Dred Scott decision *a*) the question at issue, *b*) the substance of the decision of the United States supreme court, *c*) the feelings excited in the south and in the north.

10 In his first inaugural (1861) Lincoln said, "I have no purpose directly or indirectly, to interfere with the institution of slavery in the states where it exists"; yet in 1862 he determined to issue the emancipation proclamation. Give *two* satisfactory reasons to account for his change of mind.

11 Mention, in connection with American literature, *a)* a noted author and a noted work of the colonial period, *b)* the character and value of the productions of the revolutionary period, *c)* the general attitude of our great poets toward the slavery question. What has been the effect of the civil war on the literary activity of the country?

12 Compare the causes of immigration in the early colonial period with those generally operative at present. Were conditions then more favorable than they are now for the reformation of vicious immigrants? Give reasons.

Note to the student.

Kindly answer the following for the benefit of the examiner:

a Have you studied *intensively* the history of New York state or any given period of United States history?

b Have you kept a notebook?

c What books have you read in connection with your study of advanced United States history?

High School Department

174TH EXAMINATION

ADVANCED UNITED STATES HISTORY

Thursday, June 19, 1902—9.15 a. m. to 12.15 p. m., only

Answer eight questions but **no more.** *If more than eight are answered only the first eight answers will be considered. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

1 Write on the following: (*a*) the earliest recorded discovery of America, (*b*) the naming of the new world.

2 Compare the English colonists with the French colonists of North America, touching on the following: (*a*) religious differences, (*b*) relations with the Indians, (*c*) relative merits as settlers, (*d*) government.

3 State in regard to the Dutch control of New Netherlands (*a*) why it was dangerous to the English colonies, (*b*) how it was lost. To what portions of New York state were settlements generally confined till after the Revolution? Give reasons.

4 State *two* purposes of the Albany congress. Describe Franklin's plan of union. Show how this plan was regarded by (*a*) the English government, (*b*) the colonial legislatures.

5 Compare, noting likenesses and differences of political organization, the three classes of American colonies established by the English government.

6 Explain why Hessians were employed in the Revolution. State how the employment of Hessians was regarded by (*a*) the colonists, (*b*) European rulers.

7 Give reasons, based on facts of colonial history, that indicate the wisdom of *one* of the following prohibitions in the first amendment to the Constitution: "Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech or of the press."

8 Sketch the life of Thomas Jefferson, touching on (*a*) education, (*b*) most noted literary production, (*c*) attitude toward slavery, (*d*) political sympathies, (*e*) services as president.

9 Show the influence of *each* of the following on the development of a national spirit: (*a*) the northwest territory, (*b*) the admission of new states, (*c*) the Louisiana purchase, (*d*) the War of 1812, (*e*) the oratory of Clay and of Webster.

10 State the provisions of the Missouri Compromise. Show how the Missouri Compromise was set aside by (*a*) the Kansas-Nebraska Bill, (*b*) the Dred Scott Decision.

11 Summarize the sources of military strength and weakness in the southern confederacy at the outbreak of the Civil War.

12 State and explain *one* economic and *one* political difficulty that resulted from the recent war with Spain.

Note to the student.

Kindly answer the following for the benefit of the examiner.

a Have you studied *intensively* the history of New York state or any given period of United States history?

b Have you kept a notebook?

c What books have you read in connection with your study of advanced United States history?

High School Department

171ST EXAMINATION

CIVICS

Thursday, September 26, 1901 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Define *five* of the following: caucus, appropriation, libel, quorum, extradition, contract, ex post facto law.

2 Distinguish between confederacy and nation. Illustrate by reference to United States history.

3 Show the necessity to a republic of free, tax-supported schools.

The following *five* questions refer to New York state:

4 State when and explain how the present state constitution was established.

5 Give with reference to *each* of the following *a*) mode of election, *b*) length of term, *c*) principal duty: school district clerk, supervisor, county treasurer.

6 Give in substance the provision of the constitution in reference to *a*) freedom of speech, *b*) power of the state to contract debts.

7 State the manner of obtaining office, the length of term and *two* duties of *each* of the following: governor, superintendent of public instruction.

8 Describe *one* of the following, touching on *a*) organization, *b*) duties: state board of health, civil service commission.

The following questions refer to the United States:

9 Mention *three* ways in which the constitution safeguards the rights of a person accused of crime.

10 State how *each* of the following is chosen and mention the chief duties of each: vice-president, United States senator, postmaster-general.

11 Explain the necessity of a national judiciary.

12 Give an outline of the government of a territory, touching on *a*) executive officers, *b*) legislature, *c*) courts.

13 What is a patent and how is it obtained? State the purpose for which patents are issued.

14 Mention the chief subjects of which the department of the interior has charge.

15 State what is meant by powers implied in the constitution and show the importance of such powers in securing effective government.

University of the State of New York

High School Department

172D EXAMINATION

CIVICS

Thursday, January 30, 1902 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Define *five* of the following: constitution, charter, anarchy, guardian, ambassador, forgery, extradition.

2 Distinguish between a limited monarchy and a republic. Give an example of each.

3 Show the necessity of laws and state *two* limitations imposed by law on individual liberty.

4 Explain the importance of the signature of the wife to a deed of real estate conveyed by a married man.

The following *five* questions refer to New York state:

5 Give with reference to each of *two* of the following *a*) mode of selection, *b*) length of term, *c*) manner of compensation, *d*) *two* duties: school-district collector, supervisor, district attorney.

6 Describe the organization and mention the principal functions of the state board of charities.

7 State the manner of obtaining office, the length of term and the chief duty of each of *three* of the following: governor, member of assembly, secretary of state, commissioner of excise.

8 Give in substance the constitutional provision in relation to *one* of the following: prison labor, liability of stock-holders of banks. State a reason for the provision mentioned.

9 Give an outline of the method of legal procedure in ordinary civil cases.

The following questions refer to the United States:

10 Give the substance of the law governing naturalization.

11 State *two* particulars in which the constitutional qualifications of the president and of a member of the house of representatives differ. Account for these differences.

12 Mention *four* subjects of which the department of the interior has charge.

13 Give the substance of the constitutional provision regarding *a*) judgment in case of impeachment, *b*) privileges of members of congress.

14 State how *each* of the following officers is chosen and mention the chief duties of each: secretary of war, vice-president, United States senator.

15 Mention *two* powers denied to the states by the constitution, giving a reason in each case.

High School Department

173D EXAMINATION

CIVICS

Tuesday, March 25, 1902 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Define *five* of the following: bill, law, patent, reprieve, perjury, excise, quorum.

2 Distinguish between absolute civil rights and relative civil rights and give an example of each.

3 What is meant by right of eminent domain? Explain the importance of this right to a national government.

4 Define partnership and state the limits of financial responsibility of one partner for the acts of another partner.

The following five questions refer to New York state:

5 Give in substance an important provision of the constitution in reference to *one* of the following: appropriation bills, prison labor.

6 Give with reference to each of *two* of the following *a*) manner of obtaining office, *b*) length of term, *c*) manner of compensation, *d*) *two* duties: justice of the peace, highway commissioner, county judge.

7 Describe *one* of the following, touching on *a*) organization, *b*) principal functions: state commission of prisons, the department of labor.

8 State the manner of obtaining office, the length of term and the chief duty of each of *three* of the following: lieutenant-governor, superintendent of insurance, state treasurer, judge of the court of claims.

9 Give an outline of the method of procedure in criminal cases.

The following questions refer to the United States:

10 Mention *five* executive powers of the president.

11 Give in substance the provision of the constitution in reference to *a*) apportionment of representatives, *b*) prohibition on members of congress.

12 State how *each* of the following is chosen and mention the chief duty of each: secretary of the treasury, speaker of the house of representatives, United States senator.

13 Outline the steps by which a bill becomes a law of the United States.

14 Mention the principal sources from which the United States government derives its revenues. State *three* purposes for which the government may properly levy taxes.

15 Describe the organization and state the principal function of the highest court of the United States.

High School Department

174TH EXAMINATION

CIVICS

Thursday, June 19, 1902 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Define *five* of the following: citizen, civil right, caucus, treaty, privateer, robbery, codicil.

2 Show how public opinion operates as a check against abuses of government.

3 Explain the meaning of the terms initiative and referendum as applied to legislation.

4 Distinguish between express contract and implied contract. Mention *two* conditions under which a contract is not binding.

The following five questions refer to New York state:

5 State the manner of obtaining office, the length of term and the chief duty of each of *three* of the following: comptroller, regent of the University of the State of New York, adjutant-general, superintendent of public works.

6 Give in substance the provision of the Constitution in reference to each of *two* of the following: civil service appointments and promotions, forest preserve, damages for injuries causing death.

7 Describe *one* of the following, touching on (*a*) organization, (*b*) principal function: State Board of Railway Commissioners, Court of Appeals.

8 State the length of term, manner of compensation and *two* duties of *each* of the following: town assessor, county clerk, school commissioner.

9 Give with reference to each house of the Legislature (*a*) number of members, (*b*) title of presiding officer. Explain the advantage to the people of a legislature consisting of *two* houses.

The following questions refer to the United States:

10 Mention *three* powers delegated to Congress by the Constitution, giving a reason in each of *two* cases.

11 Show the importance of the power of the Senate to reject nominations made by the president.

12 State how *each* of the following is chosen and mention *two* duties of each: member of the House of Representatives, secretary of state, United States consul.

13 Outline the steps by which a territory becomes a state of the Union.

14 Mention with reference to the president (*a*) *two* executive powers, (*b*) *one* legislative power, (*c*) *one* judicial power.

15 State in regard to the Constitution (*a*) *two* ways of proposing amendments, (*b*) *two* ways of ratifying amendments.

University of the State of New York

High School Department

171ST EXAMINATION

ECONOMICS

Wednesday, September 25, 1901 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Define *five* of the following: interest, price, dividend, market, economics, natural agent, plant for production.

2 Show by illustration or otherwise that self-interest is the leading motive of human effort.

3 Mention with reference to division of labor *a*) *two* advantages to workmen, *b*) *two* possible disadvantages to workmen, *c*) *one* limitation in its application.

4 State the effect on prices of a fall in the value of money, giving a historical illustration.

5 State the circumstances under which capital is said to be *a*) productive, *b*) unproductive. Mention some causes that tend to render capital unproductive.

6 Mention *three* considerations that stimulate the desire for the ownership of land.

7 State the effect of the development of railways on the rent value of farm lands located *a*) near large markets, *b*) remote from markets.

8 Distinguish between money and wealth. Give an example of *a*) wealth in the form of money, *b*) money that is not wealth.

9 State and explain *two* principles that should guide in poor relief.

10 Explain the following: "Credit allows the wealth of the country to be more effectively employed in production."

11 Give arguments for or against the nationalization of *a*) the telegraph, *b*) railways.

12 Discuss the relative advantages and disadvantages of a strike as a remedy for labor grievances.

13 Mention the conditions that give rise to international trade. What is meant by balance of trade?

14 Explain the relation of protective duties to *one* of the following: wages, monopolies.

15 State what is meant by the single tax theory and give a reason for or against its validity.

High School Department

172D EXAMINATION

ECONOMICS

Wednesday, January 29, 1902 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Define *five* of the following: value, money, wealth, credit, supply, distribution, raw material.

2 Give *three* reasons to account for the present industrial and commercial prosperity of the United States.

3 Show by illustration how supply and demand affect the price of a given commodity.

4 Mention *three* leading considerations affecting the wages of workmen.

5 Show how the consumption of capital helps labor, and state what relations between employer and employee are likely to render industry most productive.

6 Give arguments for or against municipal ownership of street railways.

7 State *three* principles that should govern in the investment of capital.

8 Mention *two* proposed methods of dealing with the problem of foreign immigration on the part of the United States government. Discuss *one* of these methods.

9 Show by illustration that "there is a tendency to an equality of return on equal investments of capital."

10 Mention in reference to cooperative manufacturing *a*) *two* advantages, *b*) *two* possible disadvantages.

11 State the influence of extensive stock speculation on *a*) prices of commodities, *b*) credit, *c*) the moral tone of the community.

12 Define communism. Mention *two* dangers of communistic teaching.

13 State *three* methods of taxation employed by the United States government, and describe the mode of collecting taxes in the case of *one* of these methods.

14 Give *two* arguments for or against the extensive emission of redeemable paper money on the part of the national government.

15 Explain *one* of the following: *a*) Ricardo's theory of rent, *b*) the laissez-faire doctrine.

High School Department

173D EXAMINATION

ECONOMICS

Wednesday, March 26, 1902 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Define *five* of the following: economics, exchange, wages, monopoly, cost, profits, fixed capital.

2 Give facts to prove or to disprove the statement that political economy is "inhuman and pitiless" in its teachings.

3 Distinguish by illustrations between productive laborers and unproductive laborers.

4 Give *three* reasons to account for the fact that in most employments women receive less wages than men.

5 Show that material wealth consists solely in things that satisfy wants.

6 Explain the necessity, under modern conditions, of a high degree of managing skill and the practice of close industrial economies in producing articles of manufacture.

7 State facts indicating a growing tendency to the settlement of labor difficulties by conference and by arbitration.

8 Mention *two* forces that counteract the tendency of farm rents to increase. What circumstance has tended to keep agricultural products from falling in value?

9 Explain why United States government bonds show a constant upward tendency in value.

10 Discuss the effect of a protective tariff on *a*) prices of articles, *b*) remuneration of labor.

11 Show that international trade is usually due to difference in the relative cost of producing the articles exchanged.

12 Define credit. State with reference to credit *a*) *two* of its leading forms, *b*) *two* important functions.

13 Mention *two* features common to all socialistic schemes, and show the strength or weakness of *one* of the features mentioned.

14 Mention *four* essential qualities of a commodity that is used as money. Why should the general government have power to issue money and regulate its value?

15 Explain the relation that a sound banking system sustains to business prosperity. How is the holder of a national bank note secured against loss caused by the failure of the bank?

University of the State of New York

High School Department

174TH EXAMINATION

ECONOMICS

Wednesday, June 18, 1902 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Define *five* of the following: capital, rent, exchange, dividend, credit, value, arbitration.

2 Distinguish between piece wages and time wages, and explain the relative advantages to workmen of each system of wage payment.

3 Show that land, labor and capital are essential agents of production.

4 Mention *two* causes of the rapid increase of wealth in large cities.

5 Show the truth or falsity of the statement that only one party to an exchange can profit by it.

6 State *three* causes of difference in the industrial efficiency of workmen.

7 Show that transportation should be regarded as an industry and state wherein it differs from the industries of shop and field.

8 Explain the following quotation: "Give a man secure possession of a bleak rock, and he will turn it into a garden."

9 Show how the division of labor (*a*) shortens the period required for becoming an efficient workman, (*b*) increases the productiveness of labor.

10 State *two* economic rules that should govern in the consumption of capital.

11 Show that the volume of currency required for the transaction of business depends on the efficiency of the banking system of the country.

12 Mention *two* difficulties of industrial cooperation on the part of workmen. Discuss *one* of these difficulties.

13 Discuss *one* of the following statements: (*a*) "The tariff protects the workingman," (*b*) "Protection takes from the more productive and adds to the less productive industries."

14 Show the effect on interest rates likely to follow (*a*) the development of new national resources and industries, (*b*) the diminishing profits of capital.

15 Mention *two* advantages of the system of indirect taxation practised by the United States government. State a possible evil incident to this system.

High School Department

172D EXAMINATION

PSYCHOLOGY

Friday, January 31, 1902—9.15 a. m. to 12.15 p. m., only

Answer eight questions but **no more.** *If more than eight are answered only the first eight answers will be considered. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

1 State the difference between *a*) memory and imagination, *b*) a hallucination and an illusion, *c*) inductive reasoning and deductive reasoning.

2 Show how knowledge, feeling and will are involved in any phase of conscious life that you may select, stating which of these elements predominates.

3 Define consciousness, state of what it is composed and discuss its changing character.

4 While you are moving about in a dark room, your head strikes violently against a projecting shelf which for the moment you have forgotten; show in detail how this sensation becomes a perception.

5 Mention and explain the essential conditions of a good psychologic experiment.

6 Describe the production of a sensation. Give an illustration to show that contrast is necessary in the production of a sensation.

7 A friend asks you if you have a picture of the Temple of Music; you reply that you have not but that you have a very good picture of McKinley. Describe the process by which you arrive at this thought and state the law of association involved.

8 Give a physiologic and a psychologic explanation of attention.

9 It is necessary for you to choose between a position in an office and a college education; you finally decide to go to college. Trace the psychologic processes involved in coming to this decision.

10 Explain and illustrate the interdependence of judgment and concept.

11 Explain *a*) how we are able by the sense of sight alone to affirm that an object is smooth or rough, *b*) why we are able to walk without being conscious of the act.

12 Explain, with illustrations, the meaning of the following: "The products of the constructive imagination have been the only stepping stones for material progress."

High School Department

174TH EXAMINATION

PSYCHOLOGY

Friday, June 20, 1902 — 9.15 a. m. to 12.15 p. m., only

Answer eight questions but **no more.** *If more than eight are answered only the first eight answers will be considered. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

1 State, with illustrations, the difference between a physiologic fact and a psychologic fact. Show in detail how a knowledge of physiology aids in the study of psychology.

2 It is said that by consciousness we mean the mind of the present moment, the mind now; that in life we pass through a succession of nows. Give illustrations to show this changing character of consciousness.

3 Describe an experiment in psychology, stating its purpose and result.

4 A man walking on a river bank is suddenly dazzled by a very bright light; he finally discovers that it comes from a search-light on a boat. Trace the psychologic processes involved.

5 Mention and define *two* kinds of attention. Explain, with illustration, the relation of interest to attention.

6 State what is meant by the association of ideas. Give an illustration of (*a*) the law of similarity, (*b*) the law of contiguity. Explain in each case the operation of the law.

7 Give a psychologic analysis of the process through which the mind passes in forming a mental picture of the battle of Bunker Hill.

8 Describe in detail the formation of a concept. Illustrate.

9 A person coming out of a large manufacturing establishment during business hours, thinks that the street is very quiet; another person coming out of a deserted building, thinks that the street is very noisy. Account psychologically for this difference of opinion.

10 State what is meant by the law of habit. Discuss the psychologic importance of habit and give *two* directions to be observed in forming a habit.

11 Define judgment and show how it differs from reasoning. Mention *three* essentials to an accurate judgment.

12 Explain psychologically (*a*) how we are able to estimate distance by means of sight, (*b*) why we reply more quickly to a question that we expect than to one that we do not expect.

High School Department

174TH EXAMINATION

ETHICS

Tuesday, June 17, 1902—9.15 a. m. to 12.15 p. m., only

Answer eight questions but no more. *If more than eight are answered only the first eight answers will be considered. As this is an examination in ethics all questions must be answered from an ethic standpoint. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

1 Describe the subject matter and the scope of ethics. Show why ethics may be considered a normative science.

2 Explain the meaning of the following, giving argument to justify or refute it: "Right and wrong are only incidents of territory and of custom."

3 State what is meant by the moral ideal. Show that the moral ideal requires both the highest individual development and the largest social service.

4 Explain why an act may be right for your neighbor and wrong for you. Give *two* instances illustrating this fact.

5 Distinguish between (*a*) self-love and selfishness, (*b*) duty and virtue, (*c*) knowledge and wisdom.

6 State the basis of the right to (*a*) life, (*b*) liberty, (*c*) property. Show the obligation involved in each of these rights.

7 State whether or not deception is justifiable when it is designed to benefit the person deceived. Give arguments and illustrations.

8 Show why it is the duty of every man to labor. Give, with illustrations, some of the moral evils of idleness.

9 Show (*a*) why an animal is a non-moral being, (*b*) why an act done through fear of punishment is a prudential rather than a moral act.

10 Give the ethic basis of *each* of the following: (*a*) "Recompense to no man evil for evil," (*b*) "Render therefore to all their dues," (*c*) "And every man that striveth for the mastery is temperate in all things."

11 Mention and discuss *two* theories justifying legal punishment.

12 Write at least 100 words on *one* of the following: (*a*) education of character, (*b*) sanctions of morality, (*c*) conscience.

High School Department

171ST EXAMINATION

STENOGRAPHY

Thursday, September 26, 1901—9.15 a. m. to 12.15 p. m., only

NOTE—*Candidates may take one or both of these tests. The time for dictation and for transcription is indicated in each case. The shorthand notes and the transcript are to be collected by the examiner at the close of the period assigned for each transcript. Candidates are to specify the system followed in taking down the notes. Credits depend on the accuracy of the notes and of the transcription.*

FIRST TEST

Papers entitled to 75% will be accepted. 500 words to be dictated in 10 minutes and to be transcribed in 75 minutes.

MINUTES

Walter Martin, agent
Boston, Mass.

Dear sir: Acting on the authority of your representative, Mr A. R. Brown, I have had the basement and sub-
½ cellar * under our main office thoroughly cleaned, whitewashed and kalsomined, and can assure you that the work
1 has been done satisfactorily. The total cost for this * is $100, which we have paid. Will you have the kindness to remit $50 as agreed?

Yours truly
½ Philip Dexter *

Robert Bacon
Syracuse, N. Y.

Dear sir: We inclose herewith certified check for [illegible]
2 in full payment of your bill of August 5. * The goods arrived promptly and were in good condition. In fact the transaction has been perfectly satisfactory, and we can assure
½ you of further orders * should terms and prices continue favorable.

Yours truly
Williams & Morris

John Phillips
Norfolk, Va.

Dear sir: We contemplate opening a branch store in your
3 city, * having been informed that there is an excellent
opportunity for establishing a good hardware trade there.
½ We shall esteem it a great favor * if you will give us
your candid opinion in regard to the matter and also advise
us concerning a desirable location.

Very cordially yours
4 Darwin & White *

I heard a prominent graduate of one of our universities
say that when he was a student many years ago, there was in
½ the student community * almost a contempt for wealth. The
thoughts and ambitions of college men at that period were
5 in the line of higher things than wealth, * and in their estimate
of one another they regarded this as nothing. The
½ whole life of the country has greatly changed since then. *
We have become a wealthy nation. We have passed from
the simple life of a quiet town, as it were, to the luxury and
6 abundance of a great city. * The devotion of the people
to money getting has become so great as even to be alarming,
½ and the one desire which seems to unite all men * in
this matter of money is the desire to make something out
of nothing.

7 There is surely no worse sign of the times * in our day
than this. But I believe that much of the old spirit still
½ remains—at least, so far as our judgment of men goes. *

If the evil tendencies that are manifesting themselves so
strongly among our people are to be checked, and the glory
8 of the old ancestry * is to be preserved, the result must
be accomplished through the influence of educated men.
½ Those who go forth from the universities and colleges *
must show by their living and by the energy which they
display in the pursuit of the higher and nobler objects of
9 desire, * what the true life for the nation is.

The young men of this generation are in greater danger
½ of being led away in the false path, * than were those who
lived in former times. They need, therefore, the more constantly
to open their minds to the higher influences of a
10 university life. *

SECOND TEST

Papers entitled to 75% will be accepted. Candidates for state business credentials must obtain at least 90%. 500 words to be dictated in 5 minutes and to be transcribed in 55 minutes.

There are two kinds of courage, moral and physical, and it is absolutely essential for a boy or man to have both if he wishes to keep his own self-respect and to deserve the respect of others.

½ On the one hand, he must be able to master himself, * and overcome his own weaknesses. This is what we usually mean when we speak of moral courage . . . On the other hand, physical courage is the quality which enables the man not so much to master himself as to hold his own among outside rivals or enemies . . .

1 True heroism, * the essence of heroism, may be found in any calling; and while in its most evident manifestations it can develop only in crises, yet it may be, and often must be, quietly shown all the time. Its presence in one form does not excuse its absence in another.

½ The hard-working man, * who does all his home duties well, is nevertheless not to be excused if he does not possess the capacity to show in time of need the qualities that make a man die on the battle-field, and the stern, hard common sense and civic resolution which insist on decency and
2 justice * in public affairs.

So, on the other hand, no amount of headlong valor in the field, no amount of intelligent honesty in public affairs, can in any way excuse or justify failure to do one's duty to those
½ who are closest and dearest. A man must do his duty * by the state, but he can do that duty only by first doing his duty to himself and his family . . .

Heroism of the highest type is shown in countless lives where it attracts no attention. The man who, while suffering under some physical infirmity, goes on uncomplainingly
3 year after year, * earning a livelihood not merely for himself, but for those dependent on him, who stands between them and want, is a true soldier of civilization, is an American who deserves well of America. He is doing vital work for the nation . . .

½ If the average young man refrains from excess * and also works hard, if he is a good son, a good husband and father,

he becomes a good citizen. He thereby joins the army of those whose work is finally to determine the greatness of our country. The state is merely the aggregate of its citi-
4 zens, and the great qualities * that lie at the root of healthy life in the state are the qualities that lie at the root of healthy life in the family . . .

After all is said and done, the vitally heroic work is the work of the home. It is not a substitute for the fiercer
½ heroism * that is occasionally called for outside, but it is the indispensable prerequisite. The heroism of work, the heroism that consists in energetic, unceasing, uncomplaining doing of duty in the ordinary vocations of life—this is as truly the essence of heroism as the most splendid civic
5 courage or military valor. *

University of the State of New York

High School Department

172D EXAMINATION

STENOGRAPHY

Thursday, January 30, 1902—9.15 a. m. to 12.15 p. m., only

NOTE—*Candidates may take one or both of these tests. The time for dictation and for transcription is indicated in each case. The shorthand notes and the transcript are to be collected by the examiner at the close of the period assigned for each transcript. Candidates are to specify the system followed in taking down the notes. Credits depend on the accuracy of the notes and of the transcription.*

FIRST TEST

Papers entitled to 75% will be accepted. 500 words to be dictated in 10 minutes and to be transcribed in 75 minutes.

MINUTES

Morton & Hill
Boston, Mass.

Dear sirs: A position at G. R. Davidson's will be open
½ to me as soon as I leave college, * if satisfactory references
are given. When I left your service, you very kindly offered
1 to give me a letter of recommendation whenever needed. *
I now take the liberty of asking you to write such a letter
to Mr Davidson.
Very respectfully yours
Arthur Chalmers

Rogers & Watson
½ Buffalo, N. Y. *

Gentlemen: We should be pleased to have you furnish
plans and specifications for a library building which it is
2 proposed to erect on Plymouth avenue, * in this village.
The lot is 120 feet front by 170 feet deep.

Our idea is that the reading-room should be large and
½ pleasant * and that there should be a room for periodicals
adjoining. There should be a stationary loan desk and
3 shelf room for about 3000 books. *

The second story is to have an audience-room provided
½ with suitable stage, seating capacity for at least 500 people, *
and approaches that will insure convenience and safety.
The cost of the building must not in any event exceed $10,000.

4 Kindly submit plans and specifications * before February
27, as the incorporators meet on that day to take definite
action in the matter.
Yours truly
½ George Dalton, *secretary* *

My dear Frank: An important business engagement will
make it impossible for me to accept your invitation to
5 luncheon on Thursday. I will stop for you * at five this
afternoon, however, and during the drive home we can discuss
the matter to which you referred.
Sincerely your friend
½ William Wallace *

However we may regard the American occupation of the
Philippine islands as a general policy, one phase of it can
6 not fail to be pleasing. * That is the eagerness of the young
Filipinos for schooling in English, and the extensive efforts
½ which our government is making to provide it. *
The Spanish language had never been used by the natives
of the islands except by a few educated Filipinos.
7 Spain was afraid to let the natives know too much * of
what was going on in the world, and did not encourage the
acquirement of a uniform language. The native dialects
½ differ so greatly * as to hinder all movements toward unity.
The English language will give the rising generation of all
8 the islands a common medium of communication. *
The benefits that will be conferred by introducing education
will be so great that they will far outweigh the cost.
½ Moreover, the system will ultimately * reduce the expense
of the army and increase the earning power of the natives.
There is some sentimental interest in the thought that
9 new peoples * on the opposite side of the globe are beginning
to learn English, and will perhaps before many years
½ regard it as their own tongue. * The traditions of the language
are those of liberty and opportunity. It rests on us
10 to see that it means as much to its newest learners. *

SECOND TEST

Papers entitled to 75% will be accepted. Candidates for state business credentials must obtain at least 90%. 500 words to be dictated in 5 minutes and to be transcribed in 75 minutes.

Expositions are the timekeepers of progress. They record the world's advancement. They stimulate the energy, enterprise and intellect of the people, and quicken human genius . . . They broaden and brighten the daily life of the people. They open mighty storehouses of information
½ to the student. Every exposition, great or small, * has helped to some onward step. Comparison of ideas is always educational to brain and hand. Friendly rivalry follows, which is the spur to industrial improvement, the inspiration to useful invention and to high endeavor in all departments of human activity . . .

1 Trade statistics indicate that this country * is in a state of unexampled prosperity . . . We have a vast and intricate business, built up through years of toil and struggle, . . . which will not permit of either neglect or undue selfishness. No narrow, sordid policy will subserve it. The greatest skill and wisdom on the part of manufacturers
½ and producers * will be required to hold and increase it. Our industrial enterprises, which have grown to such great proportions, affect the homes and occupations of the people and the welfare of the country. Our capacity to produce has developed so enormously and our products have so mul-
2 tiplied that the problem of more markets * requires our urgent and immediate attention. Only a broad and enlightened policy will keep what we have. No other policy will get more. In these times of marvelous business energy and gain, we ought to be looking to the future, strengthening the weak places in our industrial and commercial
½ systems, * that we may be ready for any storm or strain.

By sensible trade arrangements which will not interrupt our home production, we shall extend the outlets for our increasing surplus. A system which provides a mutual exchange of commodities is manifestly essential to the con-
3 tinued and healthful growth of our export trade * . . .

Next in advantage to having the thing to sell is to have the convenience to carry it to the buyer. We must encourage our merchant marine. We must have more ships.

They must be under the American flag, built and manned and owned by Americans . . . We must build the isthmian
½ canal, * which will unite the two oceans and give a straight line of water communication with the western coasts of Central and South America and Mexico. The construction of a Pacific cable can not be longer postponed . . .

Let us ever remember that our interest is in concord,
4 not conflict, * and that our real eminence rests in the victories of peace, not those of war. We hope that all who are represented here may be moved to higher and nobler effort for their own and the world's good, and that out of
½ this city may come, not only greater commerce * and trade for us all, but, more essential than these, relations of mutual respect, confidence and friendship which will deepen and endure.

Our earnest prayer is that God will graciously vouchsafe prosperity, happiness and peace to all our neighbors, and
5 like blessings to all the peoples and powers of earth. *

—*William McKinley*

University of the State of New York

High School Department

173D EXAMINATION

STENOGRAPHY

Tuesday, March 25, 1902—9.15 a. m. to 12.15 p. m., only

NOTE—*Candidates may take one or both of these tests. The time for dictation and for transcription is indicated in each case. The shorthand notes and the transcript are to be collected by the examiner at the close of the period assigned for each transcript. Candidates are to specify the system followed in taking down the notes. Credits depend on the accuracy of the notes and of the transcription.*

FIRST TEST

Papers entitled to 75% will be accepted. 500 words to be dictated in 10 minutes and to be transcribed in 75 minutes.

MINUTES

Alton D. Rogers
New York

Dear sir: Your application for a position in our office
has received due attention. We find the references offered
½ perfectly satisfactory * and shall be glad to notify you as
soon as we have a vacancy.

Yours truly
Wright & Jenkins

Porter & Mason
1 Philadelphia, Pa. *

Dear sirs: I contemplate opening here a store for the
sale of books and stationery. Kindly send me a sched-
½ ule of prices * on all styles of ladies' note-paper, letter
paper, ruled books of account, and different qualities of pad
2 paper and notebooks. I shall be glad * if you can make
me a special offer on any one of these lines. Address in-
quiries regarding my financial standing to Merchants' ex-
½ change bank of Newark. *

Very truly yours
George Millington

Franklin R. Saunders
Boston, Mass.

Dear Frank: I expect to be in Boston next week Thurs-
3 day, the seventh, and should be delighted * to have a chat
with my old college friend and rival. Can you not meet
½ me at the usual resort about half after six * and take dinner
with me?

Cordially your friend
Arthur Davidson

Hon. J. Walter Downing
Secretary of state

Dear sir:—I inclose herewith the certificate of incorporation
4 * of the Metropolitan carwheel co. of the city and
county of New York. Will you kindly see that the certificate
½ is duly recorded? * The filing fee of $10 is herewith
remitted. Will send recording fee on receipt of your folio
estimate.

Respectfully yours
5 John J. Howard, secretary *

There are few things more valuable as an asset in business
than the reputation of being "prompt pay." Every
½ retailer should make it a rule * to discount his bills. Not
only will he thus gain the benefit of the discount itself—a
6 return for his money much larger * than he can obtain in
any way outside his business—but he will place himself on
terms with the wholesale trade from which he can frequently
½ * derive considerable pecuniary advantage. If
there is a job lot to be offered—something specially desirable
—the wholesaler invariably gives the preference to the
7 firm * which is known to be prompt in its payments.

But if you discount a bill, be sure to make your payment
½ at the time it is due. * Do not take, as some concerns
do, the two-off-ten-days discount when the payment is made
8 at the end of 20 days. * Merchants who do this are far from
standing well with the wholesale trade. The deducting of
½ more discount than is due is an imposition * that is resented,
although sometimes the wholesaler will submit, rather than
run the risk of offending a customer. But the loss he sustains
9 is pretty sure * to be made up some day. No matter
how keen a buyer a retailer may be, he does not know
½ everything, and the little he gains * by this sharp practice
may be much more than offset in some other transaction in
10 the making of which he happens to be off his guard. *

SECOND TEST

Papers entitled to 75% will be accepted. Candidates for state business credentials must obtain at least 90%. 500 words to be dictated in 5 minutes and to be transcribed in 75 minutes.

There seems to be no longer a reasonable doubt that the
United States will build, operate and control a great ship
canal to connect the waters of the Atlantic with those of
the Pacific ocean. The effect of such a canal on the world's
½ commerce becomes a question of leading importance. *

A thorough and detailed investigation was made as to the
effect which the canal would have on the development of
American industries and on the promotion of American
commerce . . . The scope of this inquiry included a careful
study of the leading industries of the different sections
1 of the United States, * and special efforts were set on foot
to ascertain by correspondence, travel and conference the
use which would actually be made of the canal by producers
and manufacturers engaged in all our more important
industries. The testimony of the business world
½ showed that all sections of the United States * would make
extensive use of this waterway, and that its benefits would
be shared by all parts of the country.

Careful inquiries were instituted to ascertain what effect
the canal would have on the traffic of American railways.
Many conferences were held with railway officials, and
2 information was obtained * by correspondence both with
railway officials and with shippers. As to the business
of the railway systems in the territory between Chicago and
New York, and of those in the southern states, the evidence
is practically unanimous that the canal will be beneficial.
½ As to the effect * of the new water route on the railways
west of the Mississippi river, the testimony is divided.
That the canal will be a rate-controlling factor of wide-reaching
importance is generally admitted, and, naturally
enough, this is feared by some railway officials. Here is the
3 crucial point of this question, *—will the canal make business
for the transcontinental railways? Some of the managers
say yes, and some say no; but the experience of history
has always been that improved facilities for water transportation
have resulted in the diversification and distribution
½ of industry and have added to the volume of business * . . .

What the rate of increase in the traffic of the canal will be after the waterway has been opened for commerce is a difficult matter to estimate. The best basis for reasoning in regard to the growth of the American canal traffic is to
4 be found in the development of the tonnage * of the Suez canal . . .

The early beginning of the work of constructing the isthmian canal seems assured. The delays of the past have been annoying to many citizens because they have realized the great service which the canal would render in promot-
½ ing the industrial and commercial progress of our country. * The postponement of the enterprise until the present time has, however, given the American people a fair chance to secure information in detail in regard to certain problems of great importance in the choice of routes as well as to mature proper plans for the execution of this great com-
5 mercial enterprise. *

High School Department

174TH EXAMINATION

STENOGRAPHY

Thursday, June 19, 1902—9.15 a. m. to 12.15 p. m., only

NOTE—*Candidates may take one or both of these tests. The time for dictation and for transcription is indicated in each case. The shorthand notes and the transcript are to be collected by the examiner at the close of the period assigned for each transcript. Candidates are to specify the system followed in taking down the notes. Credits depend on the accuracy of the notes and of the transcription.*

FIRST TEST

Papers entitled to 75% will be accepted. 500 words to be dictated in 10 minutes and to be transcribed in 75 minutes.

MINUTES

Albany N. Y. April 11, 1902

Hall & Marvin
510 Broadway, New York

½ Dear sirs: In reply to your inquiry * regarding the
financial standing of James Smith, we are pleased to say
that we have always found him trustworthy, and think you
1 would be entirely safe * in giving him credit to the amount
stated in your letter.

Yours truly
Bell & Campbell

½ Boston Mass. May 15, 1902 *

John L. Howard
New Haven Conn.

My dear sir: I regret to say that the work on my new
2 cottage at Block Island has been greatly delayed * on account of severe coast storms. It will not be possible to
½ have it ready for occupancy before July 21. *

As you were to take possession July 1, I hasten to acquaint
you with these facts in order that you may be free to make
3 other arrangements, * unless you can so change your plans
as to make the later date satisfactory. I shall await your
½ answer before taking any further action * in regard to letting the premises.

Very truly yours
Frank R. Williams

To the Faculty of Morton College

4 Gentlemen: The accident to which I referred * in my petition of March 13 still renders any use of my right arm so painful that the doctor has forbidden me to take any
½ of the written examinations. * I therefore respectfully petition that I be allowed an oral examination in history, economics and English literature early in June, and special
5 examinations * in the other regular third year subjects in September. Inclosed please find doctor's statement.

Respectfully yours
J. W. Appleton

½ Some men seem to have the idea * that a rude, blustering manner lends them dignity, and that an abrupt style of
6 speech is what people most admire in a business man. *

Yet these very men will wonder why they do not get on better in business. In spite of the actual bargains they
½ offer * they are surprised that people keep away from the store. They do not see that their repellent manner has
7 anything to do with it, * and would perhaps be astonished to learn that sensitive people would sooner pay more money where they are courteously treated than be bullied or
½ frowned upon * at a genuine bargain counter.

An affable manner is a good advertisement in itself—a gruff and surly demeanor is always a bad one . . . A bad
8 temper * and a frowning face should have no place in a business house . . . Suave, courteous manners in proprietors, managers and salespeople are in themselves great
½ attractions * in a store or other place of business. It becomes a real pleasure to trade where you are sure of kind
9 and courteous treatment . . . *

It is impossible to succeed in business nowadays unless you show an affable bearing toward those from whom you
½ expect custom . . . Soft words and smiling faces * bring back as many customers as low prices and attractive advertising, and the sooner merchants recognize this fact the
10 better will it be for their business. *

SECOND TEST

Papers entitled to 75% will be accepted. Candidates for state business credentials must obtain at least 90%. 500 words to be dictated in 5 minutes and to be transcribed in 55 minutes.

With the exception of the farming interest, no one matter is of such vital moment to our whole nation as the welfare of the wage-workers. If the farmer and the wage-worker are well off it is absolutely certain that all others
½ will be well off, too. * It is therefore a matter for hearty congratulation that on the whole wages are higher today in the United States than ever before in our history. The standard of living is also higher than ever before. Every effort of legislator and administrator should be bent to se-
1 cure the permanency * of this condition of things and its improvement wherever possible . . .

American wage-earners work with their heads as well as with their hands. Moreover, they show a personal interest in what they are doing; so that, independent of the reward, they take pride in turning out a perfect job. This is the
½ great secret * of our success in competition with the labor of foreign countries.

The most vital question with which this country, and for that matter the whole civilized world, has to deal is the problem which has for one side the betterment of social
2 conditions, moral and physical, in large cities, * and for another side the effort to deal with that tangle of far-reaching questions which we group together when we speak of "labor." The chief factor in the success of each man—wage-worker, farmer and capitalist alike—must ever be
½ the sum total of his own individual qualities and abilities. * Second only to this comes the power of acting in combination or association with others. Very great good has been and will be accomplished by associations or unions of wage-workers, when managed with forethought, and when insistence upon personal rights is united with law-abiding
3 respect * for the rights of others. The display of these qualities in such bodies is a duty to the nation no less than to the associations themselves. Finally, there must be also in many cases action by the government in order to safeguard the rights and interests of all. Under our Constitu-
½ tion * there is much more scope for such action by the separate states and the municipalities than by the nation.

When all is said and done, the rule of brotherhood remains
as the indispensable necessity to success in the kind
of national life for which we strive. Each man must work
4 for himself, * and unless he so works no outside help can
avail him; but each man must remember also that he is
indeed his brother's keeper, and that while no man who
refuses to walk can be carried with advantage to himself,
½ yet that each at times stumbles or halts, * that each at
times needs to have the helping hand outstretched to him.
To be permanently effective, aid must always take the form
of helping a man to help himself; and we can all best help
ourselves by joining together in the work that is of common
5 interest to all. *

High School Department

171ST EXAMINATION

BOOKKEEPING

Wednesday, September 25, 1901 — 1.15 to 4.15 p. m., only

Answer the first five questions and five of the others but **no more.** *If more than five of the others are answered only the first five answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–4 Make entries in cashbook and journal of the following items in proper form for posting to a double entry ledger:

Apr. 1, 1901. Philip Black and John Colburn enter into partnership to carry on a wholesale fish business. Black invests cash $8500; Colburn invests a stock of merchandise worth $6200 and a store and warehouse valued at $2500.

Apr. 2. Bought of George H. Norton, Portland, Me., 10 bbl. medium mackerel @ $9.50; 5 bbl. split herring @ $4.75. Paid for cleaning $1.50.

Apr. 3. Sold Frederick A. Hall, Albany, N. Y., 400 ℔ cod @ 6¼¢; 600 ℔ cod @ 7½¢.

Apr. 4. Sold Barker & White, Hudson, N. Y., 5 bbl. small mackerel @ $8; 6 bbl. large mackerel @ $13, and received in part payment their note at 90 days $100, balance on account.

Apr. 5. F. A. Hall paid his bill of Apr. 3, less 2% discount, by check on Farmers' national bank. [Account with bank is kept in check book only.]

Apr. 6. Sold Philip Johnson, Catskill, N. Y., 2 bbl. mackerel @ $17.50; 2 halves mackerel @ $9.25; 5 kits mackerel @ $1.85.

Apr. 9. Bought for cash 475 boxes medium scaled herring @ 14¢.

Apr. 10. Sent G. H. Norton a draft on Philip Johnson at 10 days for $62.75, in part payment of his bill of Apr. 2.

Apr. 19. Barker & White prepaid their note of Apr. 4, less interest for unexpired time, and paid cash to balance their account.

5 Post and close the merchandise account of the above transactions, assuming merchandise on hand to be worth $7000.

6 State the use of each of *three* principal books used in double entry bookkeeping. If only one book could be saved in case of fire, which should it be? Explain.

7–8 From the following ledger footings and inventories make a balance sheet:

	Dr.	*Cr.*
Proprietor	$825	$9,000
Cash	11,505 15	9,897 50
Merchandise	16,981 79	12,489 34
Bills payable	3,650	4,010 40
Bills receivable	5,480	4,283
Interest	75 12	89 75
Trade discount	133 33	189 60
Furniture and fixtures	650	
Expense	140	
Peter White	1,276 50	847 40
Malcolm Jones	917 09	1,032 10
George Goldring	804	598 89

Inventories: merchandise $6575; furniture and fixtures $500.

9 June 1, 1901. John Dorset, a commission merchant in Buffalo, N. Y., received 4 cars of spring wheat flour from Peter Tompkins, St Paul, Minn. He made the following sales: June 4, 250 bbl. @ $5.95; June 6, 125 bbl. @ $6.25; June 7, 125 bbl. @ $6.15, which closed out the consignment. The charges were, freight $120, cartage $25, commission 2½%. Make in proper form an account sales.

10 James Reid, William Wolcott and Hugh Gibson enter into partnership, investing $12,500, $21,000 and $24,000 respectively. At the end of a year they decide to dissolve the partnership. The gain for the year is $15,000, to be divided in proportion to investment; how much will each receive?

11 A plumber wishes to buy a bill of goods which amounts to $1375 list price. He receives the following offers: A will allow successive discounts of 10, 10 and 5 with 30 days credit; B will allow discounts of 20 and 5 with 30 days credit, and C will allow 25 off for cash. Assuming that he will have to borrow the money at 6% if he accepts the cash offer, show which will be the most profitable purchase.

12 Write *a*) the check mentioned in the transaction of Apr. 5, *b*) the draft mentioned in the transaction of Apr. 10.

13 Make a receipted bill covering the transaction of Apr. 6. Write the note mentioned in the transaction of Apr. 4.

14 Write an indorsement for the note mentioned in the transaction of Apr. 4, so that it will be *a*) payable to bearer, *b*) payable to John Smith or order, *c*) generally negotiable, at the same time exempting the indorser from liability to pay.

15 Define solvency, protest, shipment, consignment, contract.

High School Department

172D EXAMINATION

BOOKKEEPING

Wednesday, January 29, 1902 — 1.15 to 4.15 p. m., only

Answer the first five questions and five of the others but **no more.** *If more than five of the others are answered only the first five answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–3 Make entries in cashbook and journal of the following transactions for posting to a double entry ledger:

Jan. 2, 1902. Opened a seed business with an investment of cash $4500, merchandise $3800, store and lot $8400.

Jan. 3. Bought office furniture and books for cash $48.

Jan. 4. Bought of Dodge & Hanford 100 bu. millet @ $1.25, 75 bu. timothy @ $1.25. Paid them $150 by check.

Jan. 6. Sold James Winne 25 bu. timothy @ $1.50, 15 bu. red clover @ $7.50, 25 bu. wheat @ $1.10. He gave me his note at 90 days $130, payable at Commercial national bank, and cash $47.50.

Jan. 8. Bought of William Barker 250 bu. corn @ 60¢, 200 bu. wheat @ 95¢. Accepted his draft on me at 10 days, favor of Wilson & Wilson, payable at Commercial national bank, for amount of bill.

Jan. 11. Sold Charles Millerton, Albany, N. Y., 200 bu. oats @ 50¢, 25 bu. Alsike clover @ $7.

Jan. 13. Charles Millerton remitted the amount of his bill by a draft of Traders' national bank, Albany, signed Philip Anderson, cashier, on Tenth national bank, New York.

Jan. 14. Cash sales for the day $185.

Jan. 16. Had James Winne's note of Jan. 6 discounted at bank and proceeds placed to my credit.

Jan 18. Paid my acceptance of Jan. 8. Paid clerk's salary for two weeks $50.

4 Post and close the merchandise account of the transactions in questions 1–3, assuming that merchandise on hand is worth $4500.

5 Give directions in full for closing a double entry ledger.

6 Write the New York draft mentioned in the transaction of Jan. 13

7 Write *a*) the note mentioned in the transaction of Jan. 6, *b*) the draft mentioned in the transaction of Jan. 8, properly accepted.

8 On a promissory note for $1500, dated Jan. 11, 1901 and bearing interest at 5%, the following payments have been made: Feb. 26, $175, May 16, $10, July 16, $210. How much was due Jan. 11, 1902?

9 A broker buys 500 shares C. & O. R. R. stock Sep. 7, 1901 @ 42¾ and sells it Sep. 21 @ 47⅜. He charges brokerage ⅛% each way and interest at 6% on cost of stock. Show the account properly closed in the broker's ledger.

10–11 Give ruling and headings for a folio of a bill book and enter in the proper columns all necessary details regarding the commercial paper mentioned in the transactions of Jan. 6, 8, 16 and 18.

12 You wish to retire from the wholesale provision business. Write a letter to Thomas Wolverton, Poughkeepsie, N. Y., as a possible purchaser, giving necessary details as to stock on hand, volume of business and gain during past year. Mention the price for which you are willing to sell.

13–14 From the following ledger balances and inventories make a balance sheet showing resources and liabilities, the proprietor's net capital (present worth) and net gain or loss:

	Dr.	*Cr.*
Proprietor	....	$5,768 50
Cash	$2,763 15	
Merchandise	3,600 48	
Bills receivable	575 50	
Bills payable	....	931 56
Expense	382	
Joseph Loren	105 25	
John Philips	....	1,550
Furniture and fixtures	590 40	
Interest	....	7 61
Ralph Johnson	240 89	

Inventories: merchandise $6400; furniture and fixtures $450.

15 Define indorsement, statement, acceptance, consignment, assignment.

High School Department

173D EXAMINATION

BOOKKEEPING

Monday, March 24, 1902 — 1.15 to 4.15 p. m., only

Answer questions 1-4 and six of the others but **no more.** *If more than six of the others are answered only the first six answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1-4 Make entries in cashbook and journal of the following transactions for posting to a double entry ledger:

Feb. 1, 1902. Began a wholesale and retail carpet business with an investment of cash $3600, merchandise $4600. I owe James Porter on my note at 30 days from Jan. 11, 1902, $525. Bought office books and furniture for cash $83.

Feb. 3. Bought of Holding Brothers, Boston, 700 yards ingrain @ 55¢, 500 yards Wilton @ $2.30.

Feb. 4. Accepted Holding Brothers' draft at 10 days for amount of bill of Feb. 3. Cash sales $140.

Feb. 5. Sold Henry Cook on account 84 yards Brussels @ $1.15, 25 yards ingrain @ 65¢.

Feb. 6. Sold David Harris 175 yards Wilton @ $2.60, 75 yards oilcloth @ 34¢. Terms 2% off 5 days, net 60 days.

Feb. 7. Sold Henry Cook, 75 yards Brussels @ $1.10, 90 yards Wilton @ $2.55. Received in payment his note at 60 days, payable at Citizens' bank.

Feb. 8. David Harris paid his bill of Feb. 6, by check on Commercial national bank.

Feb. 10. Paid my note of Jan. 11 (transactions Feb. 1). Cash sales since last entry $794.80.

Feb. 11. Bought of Harrison & Gould, New York, 1000 yards linoleum @ 45¢, 500 yards moquette @ $1.40.

Feb. 13. Sent Harrison & Gould in full of account, a draft on West Side national bank, New York, bought at par at Citizens' bank, James Newcomb, cashier.

Feb. 14. Paid acceptance of Feb. 4, favor Holding Brothers.

Feb. 17. Had Henry Cook's note of Feb. 7 discounted at bank. Cash sales since last entry $540.

5-6 Post to the double entry ledger the items given in questions 1-4. Assuming that the inventory is $5181, close the merchandise account.

7 Write *a*) the draft mentioned in the transaction of Feb. 4, including acceptance, *b*) the note mentioned in the transaction of Feb. 7.

8 Write *a*) the check mentioned in the transaction of Feb. 8, *b*) the New York draft mentioned in the transaction of Feb 13.

9 Show in the invoice book entries of all items in questions 1–4 that properly belong in that book.

10 You receive Mar. 20, 1902, 495 bushels wheat from John Brown, to be sold on commission. Mar. 24 you sell the entire lot @ 82¢ a bushel. Charges are freight 12½¢ a 100 pounds, cartage $4.25, commission 2¢ a bushel. Make out account sales.

11 Give ruling and headings for a folio of a bill book (either bills receivable or bills payable).

12 Write in proper form *two* of the following: letter of guaranty, letter acknowledging remittance, letter of introduction.

13 Give the journal entry relating to the draft mentioned in the transaction of Feb. 4, as it would appear on the books of Holding Brothers.

14–15 The open accounts on Philip Minor's single entry ledger show the following footings:

	Dr.	*Cr.*
Philip Minor (proprietor)	....	$4895 60
C. M. Whitney	$811 44	178 50
John Moshier	650	850
Arthur Hackey	265 30	....

The merchandise on hand amounts to $2984.40; cashbook shows cash on hand $2377.66; bill book shows bills receivable $3500, bills payable $1680.30. Show the face of the ledger after changing to double entry. [Give all your work.]

High School Department

174TH EXAMINATION

BOOKKEEPING

Wednesday, June 18, 1902 — 1.15 to 4.15 p. m., only

Answer the first four questions and six of the others but **no more.** *If more than six of the others are answered only the first six answers will be considered. Division of groups is not allowed. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1–4 Make entries in cashbook and journal of the following transactions for posting by double entry. [Cash items are to be entered in cashbook only, and when posted, to be posted to the ledger direct]:

May 1, 1902. George Daskam, Buffalo N. Y. began a provision business with cash $4500, merchandise $2480. Bought books and furniture for cash $125. Paid rent of store for May $75.

May 1. Bought of Daniel Graham, Chicago, 50 barrels pork @ $10, 1500 pounds hams @ 10¢, 1000 pounds lard @ 7¢.

May 3. Accepted Graham's draft at 10 days for purchase of May 1, favor of Henry Johnson. Sold William Jackson, Le Roy, on account, 15 barrels beef @ $11, 10 barrels pork @ $14.

May 5. Cash sales to date $498.80.

May 7. Bought of Hart & Holcomb, Cincinnati, 75 barrels beef @ $9, 1500 pounds hams @ 10¢. Terms, 2% off 5 days, net 60 days.

May 8. Received William Jackson's note at 60 days to apply on account $150. Paid personal bills $250.

May 10. Cash sales since last entry $749. Paid clerk's salary $15.

May 12. Sent Hart & Holcomb draft of Tenth National Bank, Buffalo (Ralph Phillips, cashier) on Merchants' Exchange Bank, New York, in settlement of their bill of May 7, less discount.

5–6 Post all the items given in questions 1–4. [Write in proper column of ledger the name and page number of book *from which* the item is posted, and write in the cashbook and journal the number of the ledger page *to which* the item is posted.]

7–8 Assuming that the inventory of merchandise is $3277 and that of furniture and fixtures $110, make and close the "Loss and gain" account for the ledger called for by questions 5–6. Close the proprietor's account.

9 Write the note mentioned in the transaction of May 8. Write and explain *two* different forms of indorsement for this note.

10 Write the New York draft mentioned in the transaction of May 12.

11 A broker buys for you 450 shares of B. & O. R. R. stock Mar. 12, 1902 @ 104 and sells it Apr. 11, @ 107¾. He charges brokerage ⅛% each way and interest at 6% on cost of stock. Show the account properly closed in the broker's ledger.

12 Assuming that Daskam kept a sales book, make such entries from questions 1–4 as would properly be entered in the sales book instead of the journal.

13 Rule the debit page of a cashbook having *three* special columns and designate the heading for each column. State the chief advantage of using special columns.

14 Describe a method of preserving for convenient reference the correspondence of a provision business.

15 Define assignment, partnership, account sales, certified check, commission.

University of the State of New York

High School Department

171ST EXAMINATION

DRAWING

Thursday, September 26, 1901 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more,** *including at least one from each of the three divisions. If more than 10 are answered only the first 10 answers will be considered. Division of groups is not allowed. Drawings may be in pencil, charcoal, pen and ink or water-colors. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted. At close of examination inclose work in double sheet, and place declaration and signature on last page of double sheet.*

PICTORIAL

1 Sketch in light and shade a group of type forms one of which is curvilinear.

2–3 Copy fig. 1, enlarging at least one fourth.

Or

Draw a group of books differing in arrangement from fig. 1.

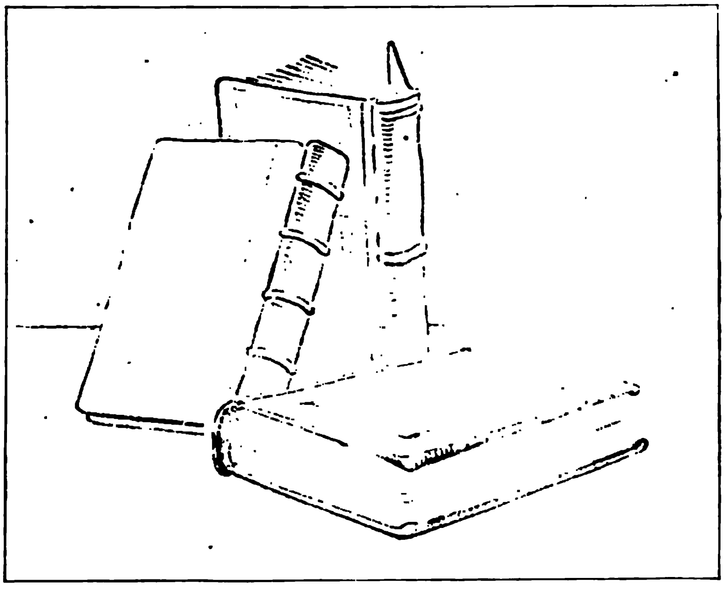

FIG. 1

4 Draw from memory or imagination a bit of natural scenery.

5 Make a sketch of some person near you.

DECORATIVE—FREE HAND AND INSTRUMENTAL

Tracing and transferring allowed

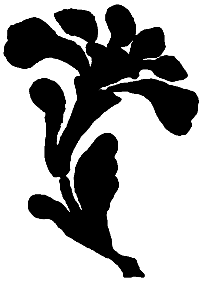

FIG. 2

6–7 Draw free hand an oblong or an ellipse of pleasing proportion. Within this figure arrange a natural flower form, making good space relations in the arrangement.

8 Draw a medieval historic ornament. Write name of ornament underneath.

9–10 Using fig. 2 as a unit, design either an all over surface pattern or a border.

GEOMETRIC—INSTRUMENTAL

Show all working lines

11–12 Draw the plan and elevation of a plain bookcase having three shelves.

13 Within a scalene triangle inscribe a circle.

14 Draw the developed surface of a hexagonal prism, each side of whose base is 1″ and whose altitude is 3″.

15 Make an oblong quatrefoil.

High School Department

172D EXAMINATION

DRAWING

Friday, January 31, 1902—1.15 to 4.15 p. m., only

Answer 10 questions but no more, including at least one from each of the three divisions. If more than 10 are answered only the first 10 answers will be considered. Division of groups is not allowed. Objects may be in sight of candidates if desired. Drawings may be in pencil, charcoal, pen and ink or water-colors. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted. At close of examination inclose work in double sheet, and place declaration and signature on last page of double sheet.

PICTORIAL

1–2 Draw a group of two objects, one of which shall illustrate the following: parallel retreating edges seem to converge.

3 Copy fig. 1, enlarging at least one fourth.

Or

Make a drawing similar in character to fig. 1.

4 Make a sketch of a person in sight.

5 Draw from memory or imagination a bit of natural scenery.

DECORATIVE

FREE HAND AND INSTRUMENTAL

Tracing and transferring allowed

6 Draw a conventionalized border suitable for ornamenting a bowl.

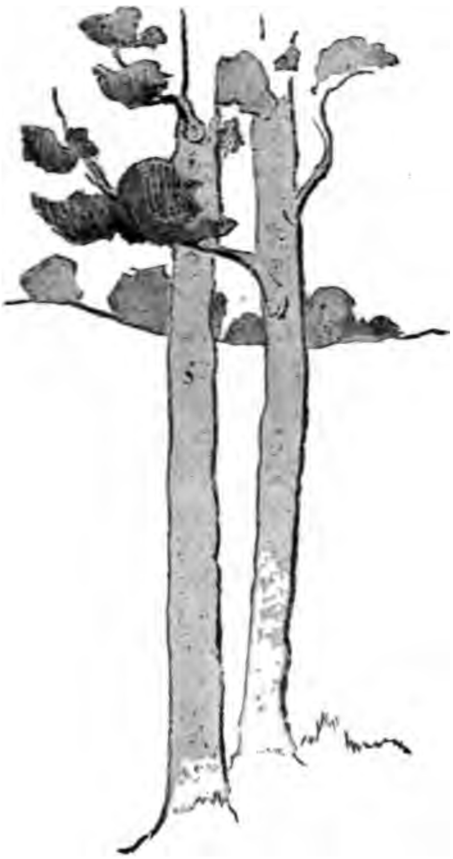

FIG. 1

7–8 Copy fig. 2, enlarging at least one fourth.

Or

Make a design for a surface-covering similar in character to fig. 2.

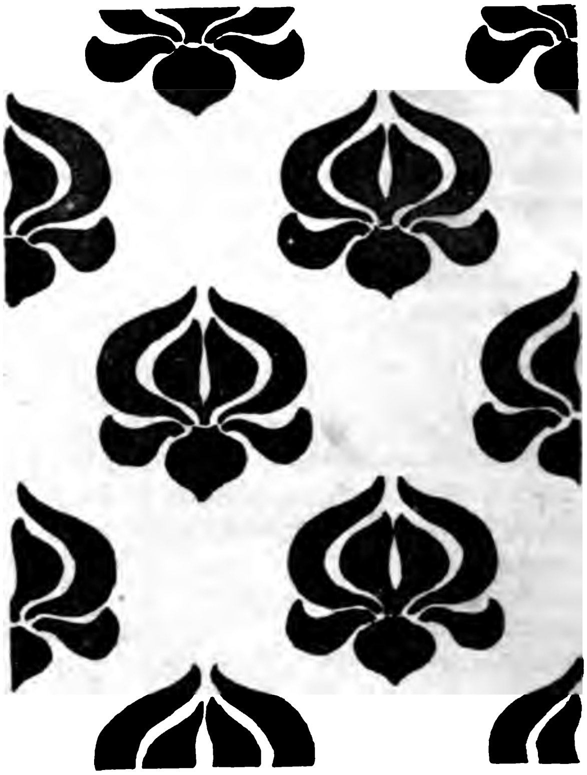

FIG. 2

9–10 Make a pleasing arrangement for decorative purposes, using a semicircle for an inclosing form and a plant form for the motive. [Nasturtium suggested.]

GEOMETRIC—INSTRUMENTAL

Show all working lines

11–12 Draw the plan and elevation of a spool.

13 Draw the developed surface of a square pyramid.

14 Trisect a four inch line, and at *one* of the points of trisection erect a perpendicular $\frac{7}{8}''$ long.

15 Construct a trefoil. [The radius of the semicircle is to be less than one half of the side of the triangle.]

High School Department

173D EXAMINATION

DRAWING

Wednesday, March 26, 1902 — 1.15 to 4.15 p. m., only

Answer 10 questions but **no more,** *including at least one from each of the three divisions. If more than 10 are answered only the first 10 answers will be considered. Division of groups is not allowed. Objects may be in sight of candidates if desired. Drawings may be in pencil, charcoal, pen and ink or water-colors. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted. At close of examination inclose work in double sheet, and place declaration and signature on last page of double sheet.*

. PICTORIAL

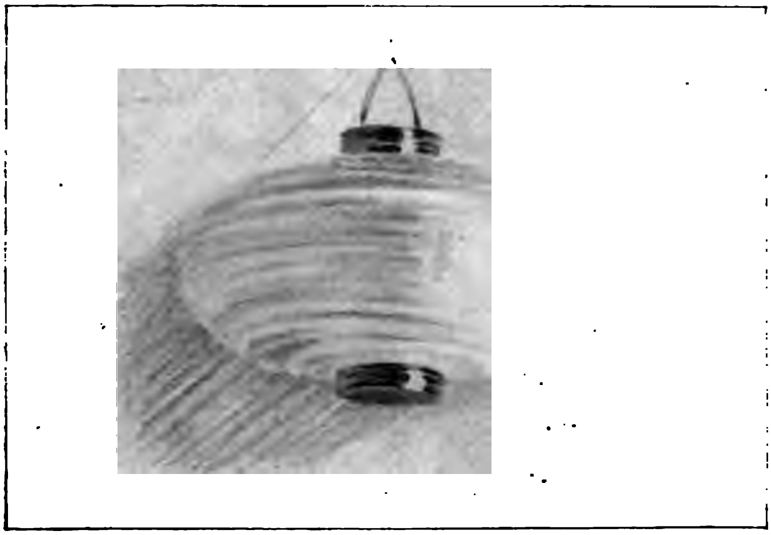

FIG. 1

1–2 Draw free hand a group of *two* type forms, one of which shall illustrate the following: a circle seen obliquely above the eye appears elliptic.

3 Copy fig. 1, enlarging at least one fourth.

Or

Make a drawing similar in character to fig. 1.

4 Draw free hand a vase that is pleasing in proportion and curvature of line.

5 Draw free hand a group, one element in the group to be an object in the room where you are.

DECORATIVE—FREE HAND AND INSTRUMENTAL

Tracing and transferring allowed

6 Make a design for an ornamental flat tile not less than 4″ square.

7 Define a bilateral form and draw an illustration.

8-9 Copy fig. 2, enlarging not less than one fourth.

Or

Make a line drawing similar in design.

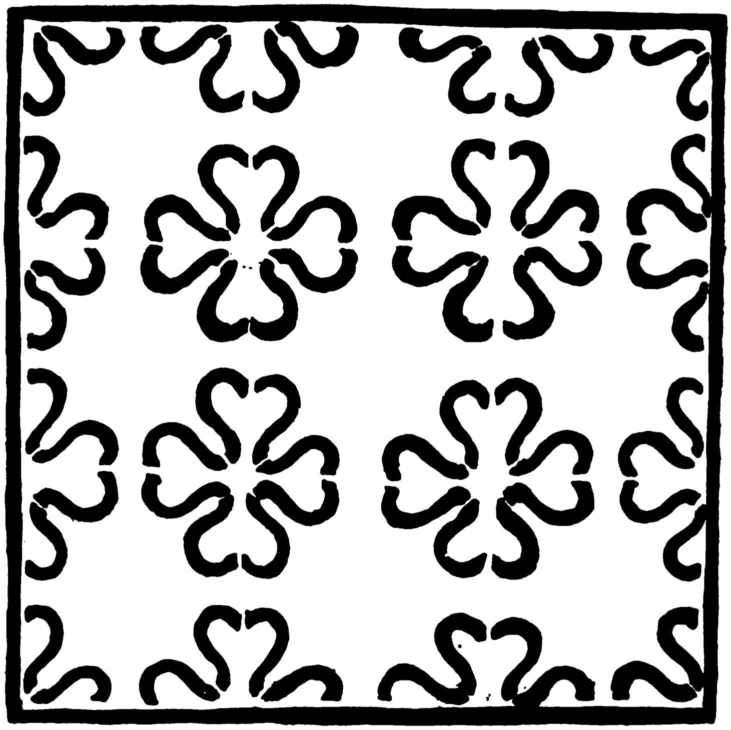

FIG. 2

10 Draw a Gothic ornament, writing its name underneath.

GEOMETRIC—INSTRUMENTAL

Show all working lines

11 Draw a line 4″ long, parallel to a given line.

12 Draw the plan and elevation of a simple object, not a type form.

13 Draw the developed surface of a conical paper lamp shade whose dimensions are as follows: diameter of base 1′, of top 4″, vertical hight 5″. Scale 1″ to 4″.

14-15 Draw top view, front view and side view of an equilateral triangular prism.

High School Department

174TH EXAMINATION

DRAWING

Friday, June 20, 1902 — 1.15 to 4.15 p. m., only

Answer 10 questions but no more, *including at least one from each of the three divisions. If more than 10 are answered only the first 10 answers will be considered. Division of groups is not allowed. Objects may be in sight of candidates if desired. Drawings may be in pencil, charcoal, pen and ink or water-colors. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted. At close of examination inclose work in double sheet and place declaration and signature on last page of double sheet.*

PICTORIAL

1 Group a cube, a cone and a sphere and represent them free hand in light and shade.

2–3 Copy fig. 1, enlarging at least one fourth.

Or

Draw a group similar in character and treatment to fig. 1.

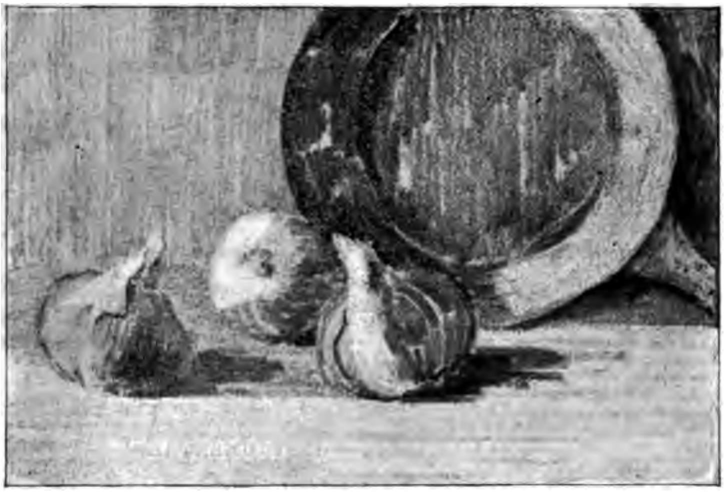

FIG. 1

4 Within a circle whose diameter is 3′, make a sketch of natural scenery.

5 Make a drawing of objects which will illustrate the following principle: distance affects the apparent size of an object.

DECORATIVE—FREE HAND AND INSTRUMENTAL

Tracing and transferring allowed in design

6–7 Draw an oblong and within it arrange a natural form to illustrate good space variation.

8 Draw an Egyptian ornament.

9 Copy fig. 2, enlarging at least one half. [An enlarged copy of one fourth of fig. 2 will be accepted.]

Or

Make a design similar in character to fig. 2.

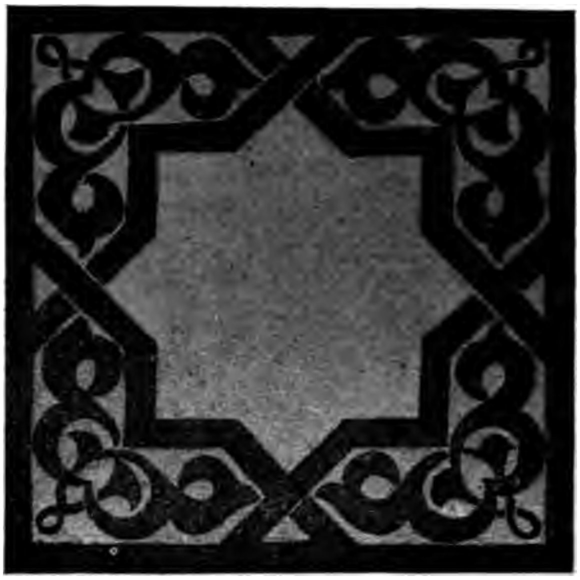

FIG. 2

10 Draw an initial letter decorative in character.

GEOMETRIC—INSTRUMENTAL

Show all working lines

11–12 Draw plan and elevation of some object cylindric in shape.

13 Draw the developed surface of a circular plinth.

14 Construct an angle of 120°.

15 Draw an inclosing form composed of semicircles and a hexagon.

High School Department

172D EXAMINATION

ADVANCED DRAWING

Monday, January 27, 1902—9.15 a. m. to 12.15 p. m., only

Answer 10 questions but **no more,** *including at least one from each of the three divisions. If more than 10 are answered only the first 10 answers will be considered. Division of groups is not allowed. Objects may be in sight of candidates if desired. Drawings may be in pencil, charcoal, pen and ink or water-colors. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted. At close of examination inclose work in double sheet, and place declaration and signature on last page of double sheet.*

PICTORIAL

1 Draw free hand, in light and shade, a basket of rectilinear shape, seen at an oblique angle.

2–3 Copy free hand fig. 1, enlarging at least one fourth.

Or

Draw a group similar in character to fig. 1.

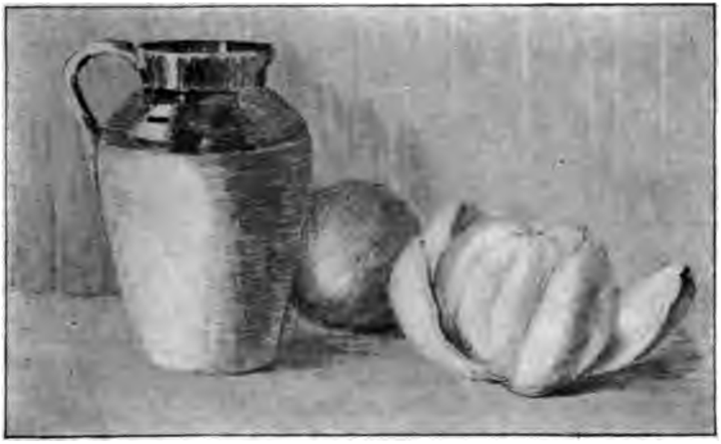

FIG. 1

4 Draw free hand a group of *three* type forms, one of which has curved outlines.

5 Make a free hand drawing of some object now in sight.

DECORATIVE—FREE HAND AND INSTRUMENTAL

Tracing and transferring allowed

6 Draw the Greek antefix.

7 Sketch a plant form from memory and make from it *three* conventionalized units.

8 Within a circle whose radius is at least 2½″, draw a border design which would be a suitable ornament for a plate. [One fourth of the border will be accepted.]

9–10 Fig. 2 is a decorative design in three tones. Copy this figure.

Or

Make an original design similar in character to fig. 2.

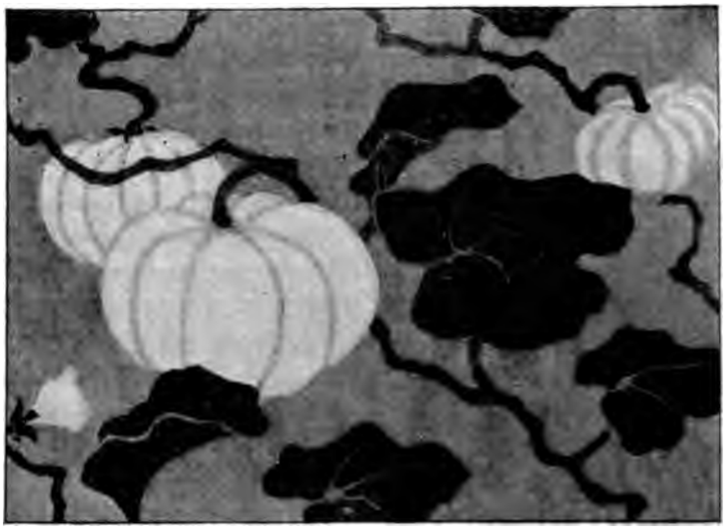

FIG. 2

GEOMETRIC — INSTRUMENTAL

Show all working lines

11 Draw the plan and elevation of the following combination: a sphere resting on a vertical square prism.

12 Draw the developed surface of a hexagonal prism, each side of whose base is ¾″ and whose altitude is 3″.

13 Within a triangle whose sides are 3″, 4″ and 5″ respectively, inscribe a circle. Without the same triangle circumscribe a circle.

14–15 Draw the plan, elevation and developed surface of the frustum of a square pyramid.

High School Department

174TH EXAMINATION

ADVANCED DRAWING

Monday, June 16, 1902—9.15 a. m. to 12.15 p. m., only

Answer 10 questions but **no more,** *including at least one from each of the three divisions. If more than 10 are answered only the first 10 answers will be considered. Division of groups is not allowed. Objects may be in sight of candidates if desired. Drawings may be in pencil, charcoal, pen and ink or water-colors. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted. At close of examination inclose work in double sheet, and place declaration and signature on last page of double sheet.*

PICTORIAL

1 Draw from nature or from memory a landscape, giving special attention to proportion and due placing of the main masses.

2 Draw free hand a group containing a vase form of pleasing outline and proportions.

3-4 Copy free hand fig. 1, enlarging at least one fourth.

Or

Draw a group similar in character to fig. 1.

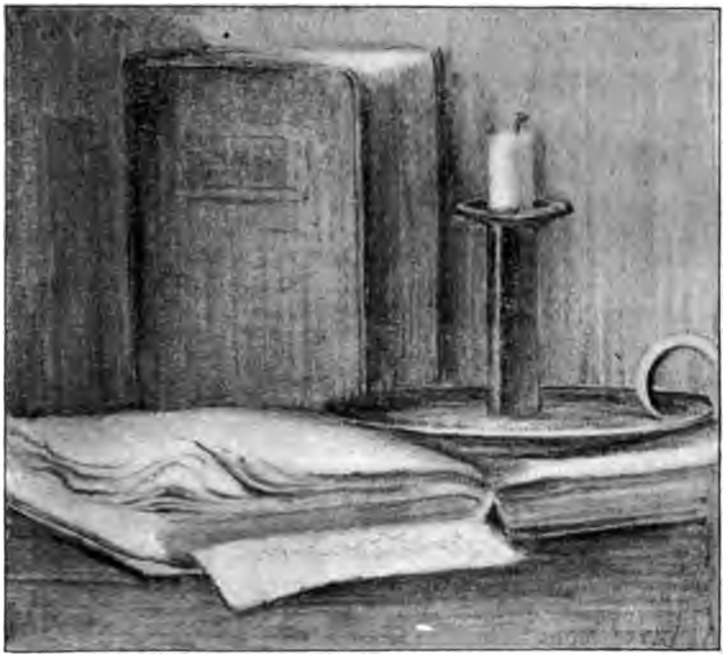

FIG. 1

5 Make a free hand drawing of a cone resting on its side, with the apex turned slightly away from the eye.

DECORATIVE — FREE HAND AND INSTRUMENTAL

Tracing and transferring allowed in design

6 Draw a Saracenic ornament.

7 Draw a plant growth within a suitable free hand outline.

8-9 Copy fig. 2, enlarging at least one fourth.

Or

Make a drawing similar in character to fig. 2.

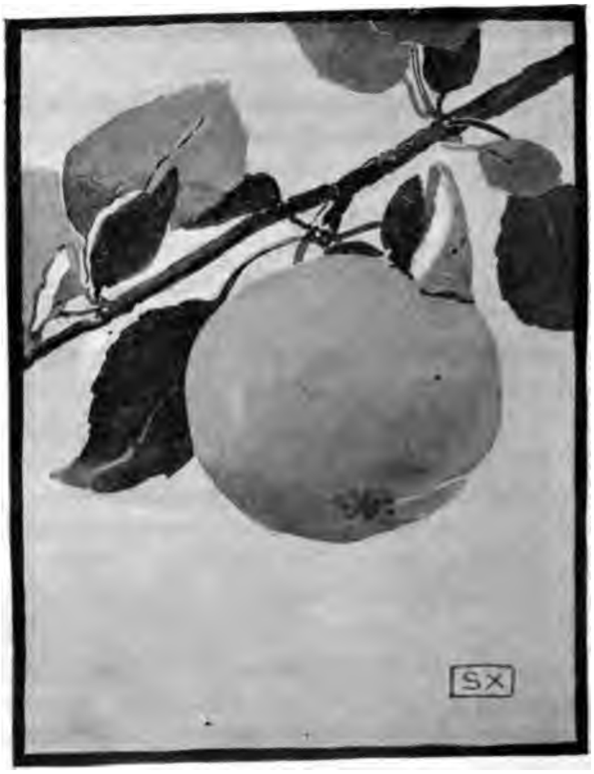

FIG. 2

10 Draw for a glove-box cover a conventionalized ornament.

GEOMETRIC — INSTRUMENTAL

Show all working lines

11 Draw plan and elevation of the frustum of a cone.

12 Draw the developed surface of a hexagonal pyramid, each side of whose base is 1" and the slant hight 3".

13-14 Draw plan, elevation and real shape of section of a cylinder 2" in diameter cut by a plane making an angle of 45° with the axis of the cylinder.

15 Construct an angle of 135° and bisect it.

High School Department

174TH EXAMINATION

WORD ANALYSIS

Tuesday, June 17, 1902—9.15 a. m. to 12.15 p. m., only

Answer 10 questions but **no more.** *If more than 10 are answered only the first 10 answers will be considered. Each complete answer will receive 10 credits. Papers entitled to 75 or more credits will be accepted.*

1 Give an analysis of *each* of the following words: *immaculate*, *implacable*, *paralyze*, *accord*. Write sentences in which these words are correctly used.

2 Give *five* words derived from the stem *struct* and show by analysis the meaning of each.

3 Show by analysis how the words in *each* of the following pairs differ in meaning: *unsatisfied*, *dissatisfied; illusion*, *delusion; dissolve*, *resolve; denounce*, *renounce; prepare*, *repair.*

4 Write words containing *five* variant forms of the prefix *sub*. State under what conditions each form would be preferred to *sub*.

5 Analyze *each* of the following words, giving the meaning of each part: *inanimate*, *enumerate*, *infliction*, *deciduous*, *respectable*.

6 Give the meaning of each of *five* of the following prefixes: *bi*, *dia*, *el*, *mis*, *be*, *non*, *post*, *inter*. Write sentences containing words formed by using the five prefixes selected.

7 Give the meaning of the stem in *each* of the following words: *prejudice*, *companion*, *immense*, *derivative*, *efficient*, *affluent*, *exorbitant*, *corolla*, *unhealthy*, *immediate*.

8 Show by analysis the idea common to *each* of the following pairs of words: *abase*, *debase; prescribe*, *proscribe; repel*, *repulse; adherence*, *adhesion; ancestor*, *antecedent*. Point out the differences in meaning.

9 Write sentences, using correctly each italicized word in question 8.

10 Give the meaning of *each* of the following stems and form a word from each stem: *the*, *arch*, *felic*, *phon*, *rat*.

11 Show by analysis the meaning of *each* of the following: *community*, *incredible*, *persuasion*, *commission*, *symmetry*. Write sentences in which these words are correctly used.

12 Show how the suffixes in the following words affect the meaning or use: *freedom*, *hillock*, *strengthen*, *wickedly*, *beautify*.

13 Explain how the words in *each* of the following pairs differ in meaning: *argue*, *discuss; debate*, *dispute; finish*, *complete; plenty*, *abundance; grieve*, *distress*.

14 Give *five* words formed from the stem *fer*. Show that the differences in meaning in these derivatives are due to the prefixes or suffixes.

15 Form *five* words, using the prefix *ob*. Write sentences, using correctly each word formed.

University of the State of New York

High School Department

PUBLICATIONS

Examination department annual reports 1894-97. O. *75c a vol.*

Till 1894 these reports formed part of the general University reports, known as the Regents reports. They cover courses of study in secondary schools, examination of professional students, licensing examinations for physicians, dentists, veterinary surgeons and certified public accountants.

Continued in 1898 as reports of college and high school departments.

Examination bulletins 1895-98. O. *To advance subscribers 50c a year.*

B4 (Examinations 1) Regents Examinations. 82p. Nov. 1890. *10c.*

Historical sketch, laws, ordinances and rules pertaining to all examinations conducted by the Regents; details as to all University credentials; subjects, times and places of examinations 1891-95; notes on the reorganization of 1890.

B5 (Examinations 2) Academic Syllabus. 174p. Ap. 1891. *Replaced by* X8.

B10 (Examinations 3) Medical Syllabus. 30p. Oct. 1892. *Replaced by* X7.

B13 (Examinations 4) Law Syllabus. 120p. Mar. 1893. *Out of print.*

Outline of ground covered by examinations for the Regents degree of bachelor of laws.

B23 (Examinations 5) Report of Examination Department 1893. 82p. Feb. 1894. *10c.*

X6 Report of Examination Department 1894. 126p. Mar. 1895. *15c.*

X7 Medical Syllabus. 128p. Mar. 1895. *25c.*

Outline of ground covered by state licensing examinations, prepared under direction of the state boards of medical examiners for guidance of candidates.

X8 Academic Syllabus. 204p. June 1895. *Replaced by* X24.

Syllabus of Form Study and Drawing. 30p. 32pl. *25c.*

Reprint of p. 410-34d and plates from X8.

X9 Report of Examination Department 1895. 108p. Feb. 1896. *15c.*

X10 Examination Papers 1896. 502p. Oct. 1896. *50c; small paper edition uniform with previous volumes 25c, boards 50c.*

See also Question papers.

X11 Davis, W: M. (Harvard) State Map of New York as an Aid to the Study of Geography. 28p. Nov. 1896. *5c.*

Based on the topographic map in preparation by the U. S. Geological Survey.

X12 Report of Examination Department 1896. 114p. Jan. 1897. *15c.*

X13 College-entrance English. 148p. June 1897. *15c.*

Present English entrance requirements of representative colleges and universities. Also discussions on aims and methods in teaching secondary school English.

X14 Examination Papers 1897. 578p. Aug. 1897. *Price, see* X10.

X15 Report of Examination Department 1897. 120p. Nov. 1897. *15c.*

X16 Examination Papers 1898. 512p. Sep. 1898. *Price, see* X10.

The second edition contains only the academic papers, the professional papers being printed separately as College bulletin 3.

High school department annual reports 1898–date. O. *75c*

High school department bulletins 1898–date. *To advance* *subscribers 50c a year.*

X17 (High school 1) Director's Report 1898. Mar. 1899. 122p.

X18 (High school 2) State Science Teachers Association. Proce ings of the Third Annual Meeting, Dec. 1898. 202p. Nov. *Out of print.*

X19 (High school 3) Associated Academic Principals. Proceedi of the 14th Annual Conference, Dec. 1898. 236p. Dec. 1899

X20 (High school 4) Academic Examination Papers 1899. 30 Oct. 1899. *25c. Small size* 12.5 x 20 *cm, 25c; boards, 50c.*

X21 (High school 5) Director's Report 1899. 70p. Feb. 1900

X22 (High school 6) Associated Academic Principals. Proceedi of the 15th Annual Conference, Dec. 1899. 188p. Mar. 1900.

X23 (High school 7) State Science Teachers Association. Proce ings of the Fourth Annual Meeting, Dec. 1899. 302p. May 1900.

X24 (High school 8) Academic Syllabus. 226p. Ap. 19 *25c; cloth 50c.*

The University declines to recommend any special textbooks, but for guidance of teachers and students it specifies the ground covered by the liminary and academic subjects. This syllabus is the best available outli what should be accomplished in these subjects.

X25 (High school 9) Manual Training Syllabus. 60p. May 1900.

X26 (High school 10) Academic Examination Papers 1900. 3 Aug. 1900. *Price, see X20.*

X27 (High school 11) Director's Report 1900. 38p. Feb. 1901.

X28 (High school 12) Associated academic principals. Proceedi of the 16th Annual Conference, Dec. 1900. 164p. Ap. 1901.

X29 (High school 13) State Science Teachers Association. Proce ings of the Fifth Annual Conference, Dec. 1900. 150p. May 1901

X30 (High school 14) Academic Examination Papers 1901. 5 Aug. 1901. *25c; boards 50c.*

X31 (High school 15) Director's Report 1901. 34p. Jan. 1902.

X32 (High school 16) Associated Academic Principals. Proceedi of the 17th Annual Conference, Dec. 1901. 196p. Mar. 1902.

X33 (High school 17) State Science Teachers Association. Proce ings of the Sixth Annual Conference, Dec. 1901. *In press.*

X34 (High school 18) Academic Examination Papers 1902. 31 July 1902. *25c; boards 50c.*

Question papers. For the academic year 1892 (v. 1); 1893 (v 1894 (v. 3); 1895 (v. 4). D. *25c; boards 50c.*

For 1896-98 see X10, X14, X16; 1899 see X20; 1900 see X26; 1901 see X 1902 see X34. Till 1896 each volume contained all the Regents question pa of that year in any of the academic, professional law, medical, dent veterinary, library and extension examinations. After the first edition the 1895 examination papers the academic and professional papers w separated.

Published monthly by the
University of the State of New York

BULLETIN 267 JUNE 1903

595576

High School Department

INCLUDING ACADEMIES AND ALL INTERESTS OF SECONDARY EDUCATION

Bulletin 19

ASSOCIATED ACADEMIC PRINCIPALS

PROCEEDINGS OF THE

18TH ANNUAL CONFERENCE

Held in assembly hall of Syracuse High School, Dec. 29-31, 1902

PAGE
Officers for 1902 and 1903 319
Summary of sessions 319
" **action** 321
Addresses, papers and discussions 327
Annual address: Thoroughness versus Breadth: Pres. Rush Rhees 328
The High School in its Relation to Commercial Education: Sup't Emmet Belknap...... 339
Different and Indifferent Degrees of Preparation for College in English: Pres. M. W. Stryker...................... 366

PAGE
Manual Training in Villages and Small Cities: Prin. Vinton S. Paessler 379
High School Societies
Prin. Joseph E. Banta 397
Prin. Schuyler F. Herron..... 402
Prin. A. J. Mac Elroy........ 404
Prin. F. H. Brown........... 405
Sup't George Griffith........ 406
President Fosdick 406
St Louis Exposition: Dr Henry L. Taylor.................... 409
The Strike of the Schoolmasters
Prin. William K. Wickes.... 411
Register of attendants 433
Index 449

ALBANY
UNIVERSITY OF THE STATE OF NEW YORK
1903

2290m-Mr3-1000 Price 20 cents

University of the State of New York

REGENTS

With years of election

1892	William Croswell Doane D.D. LL.D.	*Chancellor*, Albany
1878	Whitelaw Reid M.A. LL.D. *Vice Chancellor*,	New York
1877	Chauncey M. Depew LL.D.	New York
1877	Charles E. Fitch LL.B. M.A. L.H.D.	Rochester
1881	William H. Watson M.A. M.D. LL.D.	Utica
1881	Henry E. Turner LL.D.	Lowville
1883	St Clair McKelway M.A. L.H.D. LL.D. D.C.L.	Brooklyn
1885	Daniel Beach Ph.D. LL.D.	Watkins
1888	Carroll E. Smith LL.D.	Syracuse
1890	Pliny T. Sexton LL.D.	Palmyra
1890	T. Guilford Smith M.A. C.E. LL.D.	Buffalo
1893	Lewis A. Stimson B.A. LL.D. M.D.	New York
1895	Albert Vander Veer M.A. Ph.D. M.D.	Albany
1895	Charles R. Skinner M.A. LL.D.	Superintendent of Public Instruction, ex officio
1897	Chester S. Lord M.A. LL.D.	Brooklyn
1900	Thomas A. Hendrick M.A. LL.D.	Rochester
1901	Benjamin B. Odell jr LL.D. Governor, ex officio	
1901	Robert C. Pruyn M.A.	Albany
1902	William Nottingham M.A. Ph.D.	Syracuse
1903	Frank W. Higgins Lieutenant Governor, ex officio	
1903	John F. O'Brien Secretary of State, ex officio	
1903	Charles A. Gardiner LL.B. M.A. Ph.D.	New York
1903	Charles S. Francis B.S.	Troy

SECRETARY

Elected by Regents

1900 James Russell Parsons jr M.A. LL.D.

DIRECTORS OF DEPARTMENTS

1888 Melvil Dewey M.A. LL.D. *State Library and Home Education*

1890 James Russell Parsons jr M.A. LL.D. *Administrative, College and High School Dep'ts*

1890 Frederick J. H. Merrill Ph.D. *State Museum*

University of the State of New York

High School Department

INCLUDING ACADEMIES AND ALL INTERESTS OF SECONDARY EDUCATION

Bulletin 19

ASSOCIATED ACADEMIC PRINCIPALS

PROCEEDINGS OF THE

18TH ANNUAL CONFERENCE

Held in assembly hall of Syracuse High School, Dec. 29-31, 1902

OFFICERS FOR 1902

President, Frank S. Fosdick, Buffalo
Secretary, S. Dwight Arms, Albany
Treasurer, Ernest E. Smith, Canajoharie
Executive committee: Gary M. Jones, Watertown; A. C. Anderson, Forestville; Robert K. Toaz, Oxford

OFFICERS FOR 1903

President, T. H. Armstrong, Medina
Vice president, Howard Conant, Elmira
Secretary, S. Dwight Arms, Albany
Treasurer, Ernest E. Smith, Canajoharie
Executive committee: E. M. Sanford, Argyle; E. F. McKinley, Freeport; W. S. Steele, Olean

SUMMARY OF SESSIONS

1st session, Monday, December 29, 8.35 p. m.

Association called to order by President Frank S. Fosdick

Remarks by the president

Thoroughness versus Breadth: annual address

President Rush Rhees, University of Rochester

2d session, Tuesday, December 30, 9.15 a. m.

The High School in its Relation to Commercial Education
Superintendent Emmet Belknap, Lockport public schools
Inspector I. O. Crissy, University of the State of New York
Principal D. C. Farr, Glens Falls Academy
Superintendent George Griffith, Utica public schools
Principal E. F. McKinley, Freeport
President C. C. Gaines, Eastman, Poughkeepsie
Principal J. L. Lusk, Union High School
Principal L. W. Hoffman, South Side High School, Rockville Center.
President George H. Ball, Keuka College

The Different and Indifferent Degrees of Preparation for College that appear in English, specially in Composition, Spelling and Plain, Old-fashioned Reading Aloud
President M. Woolsey Stryker, Hamilton College
Principal W. B. Chriswell, Niagara Falls Public School
Principal L. F. Hodge, Franklin Academy, Malone
President B. W. Hutchinson, Genesee Wesleyan Seminary, Lima
Inspector Charles F. Wheelock, University of the State of New York
Principal F. D. Boynton, Ithaca High School
Principal D. C. Farr, Glens Falls Academy
Principal John Holly Clark, Flushing High School
Superintendent Emmet Belknap, Lockport public schools
Principal Howard Conant, Elmira High School

3d session, Tuesday, 2.15 p. m.

Manual Training in Villages and Small Cities. (1) To What Extent is it Practicable? (2) To What Extent should it be Carried?
Principal Vinton S. Paessler, Barlow School of Industrial Arts, Binghamton
Principal L. W. Hoffman, South Side High School, Rockville Center
Principal J. L. Lusk, Union High School
Principal Howard Conant, Elmira High School
Principal F. C. White, Cornwall-on-Hudson High School

Principal JOSEPH EDWARD BANTA, Binghamton High School
Professor GEORGE H. LOCKE, University of Chicago
High School Societies
Principal JOSEPH EDWARD BANTA, Binghamton High School
Principal SCHUYLER F. HERRON, Herkimer High School
Principal ANDREW J. MACELROY, Windsor High School
Principal F. H. BROWN, East Syracuse High School
Superintendent GEORGE GRIFFITH, Utica public schools
Principal FRANK S. FOSDICK, Masten Park High School, Buffalo
The St Louis Exposition
Dr HENRY L. TAYLOR, University of the State of New York

4th session, Tuesday, 8.15 p. m.

Principal WILLIAM K. WICKES, Syracuse High School
The Strike of the Schoolmasters

5th session, Wednesday, December 31, 9.30 a. m.

Transfer of duties to the new president by
Principal FRANK S. FOSDICK, Masten Park High School, Buffalo
Response
Principal THOMAS H. ARMSTRONG, Medina High School
Adjourned 9.50 a. m.

SUMMARY OF ACTION

Appointments

Tuesday morning President FOSDICK announced the following committees:

Committee on nominations. C. H. WARFIELD, Little Falls; O. W. Wood, Delhi; H. D. BARTLETT, Holley. [For report *see* p. 325]

Committee on resolutions. D. C. FARR, Glens Falls; F. L. SHEPARDSON, Hamilton; F. A. VOGT, Buffalo; S. F. HERRON, Herkimer; L. F. HODGE, Malone. [For report *see* p. 325]

Tuesday afternoon the president named a committee of three to send greetings to the various other educational bodies then in session, designating for that purpose Leigh R. Hunt of Corning, W. G. Welker of Williamsville and Arthur M. Preston of Attica.

State aid to nonresident pupils

Tuesday afternoon the following action was taken in regard to Governor Odell's proposal, that the State pay the tuition of nonresident pupils in academic grades.

Inspector Wheelock — I wish to ask unanimous consent to introduce a resolution, though it is not in the direct order of procedure, and to move that this resolution have immediate consideration instead of being referred to the committee on resolutions.

The necessary permission being given, Inspector Wheelock said:

We have in this State a governor who believes in and enforces the practice of strict economy in the administration of the state government, but who is broad enough to perceive that the truest economy does not always consist in lessened expenditure but rather in a wise use of public funds. In view of Governor Odell's attitude on the question of expenditures for education, I desire to offer the following resolutions and to ask their immediate consideration.

Resolved, That the thanks of the academic principals of the State of New York are due and are hereby tendered to Gov. Benjamin B. Odell for his wise and earnest efforts for the advancement of education in this state.

Resolved, That we heartily approve the proposition that the tuition of nonresident pupils in academic grades be paid by the State, and that we urge on the Legislature the importance of appropriating funds and perfecting the legislation necessary to put the same in execution.

Supervisor Isaac H. Stout — I would like to second that resolution in behalf of the State Superintendent of Public Instruction, who is on record in his reports as favoring this plan; also in order to have it thoroughly understood by the academic principals that both departments are heartily behind the resolution that has been offered.

The motion to consider the resolutions was carried.

Moved, That the resolutions as read be adopted as the sense of this meeting of the Associated Academic Principals.

Motion seconded by Principal Armstrong.

The resolutions were unanimously carried.

National Educational Association

Principal D. C. Farr introduced the subject of representation of the association at the Boston meeting of the National Educational Association; and, on motion of Prin. C. H. Warfield, power was given to Inspector C. F. Wheelock to select a committee to represent the academic principals at the meeting of the National Educational Association.

St Louis Exposition

Dr Henry L. Taylor, in behalf of the conference committee representing the educational organizations of the State of New York, requested that the Academic Principals Association appoint a permanent representative on the committee, which will prepare an exhibit of the state's educational activities for the St Louis Exposition to be held in 1904 [*see* p. 409].

Voted, That the executive committee be empowered to use their judgment in this matter and appoint such a representative as they see fit.

Reports

TREASURER

ASSOCIATED ACADEMIC PRINCIPALS

in account with Ernest E. Smith, *treasurer*

Receipts

1902				
Jan.	1	Jay Crissey, treasurer	$600 ..	
June	19	Jay Crissey, treasurer	216 04	
Dec.	29–31	Dues of 1902	440 ..	
1903				
Jan.	1	Accrued interest	21 19	
				$1 277 23

Payments

1902			
June	23	J. B. Lyon Co., printing pamphlets	$16 ..
Aug.	8	C. P. Brate, printing stationery	25 76
		C. F. Williams, printing circulars	9 ..
		H. J. Hamilton, postage mailing circulars	19 20
	26	Executive committee, expenses	28 08
Dec.	22	Badges and registration cards	17 10
	31	S. Dwight Arms, salary as secretary	50 ..
		Ernest E. Smith, salary as *treasurer*	25 ..

		F. S. Fosdick, postage and sundry disbursements	3 32	
1903				
Jan.	2	S. Dwight Arms, postage and sundry disbursements	22 54	
		Helen Wyncoop, stenographer	8 38	
		F. D. Boynton, account syllabus committee	5 60	
		E. W. Lyttle, postage	3 20	
		C. F. Williams, printing programs	28 75	
		Rush Rhees, expenses	19 85	
	8	W. K. Wickes, janitor service and printing tickets	5 45	
	12	Cyrus L. Barnes, printing stationery	10 35	
	17	Ernest E. Smith, postage and sundry disbursements	4 81	
	26	M. L. Vanderzee, transcribing proceedings of 18th holiday conference	30 ..	
				332 39
	30	Balance on hand		$944 84

Held by Albany Savings Bank	$721 19	
Held by Albany County (National) Bank	21 78	
Held by Canajoharie National Bank	201 87	
		$944 84

EXECUTIVE COMMITTEE

The following budget for the ensuing year was approved:

For executive committee	$50
legislative committee	100
syllabus committee	50
printing and sundry expenses	100
secretary's salary	50
treasurer's salary	25
St Louis Exposition	25
stenographer	50
	$450

COMMITTEE ON NOMINATIONS

The following were recommended:

Officers. *President,* T. H. Armstrong, Medina; *Vice president,* Howard Conant, Elmira; *Secretary,* S. Dwight Arms, University of the State of New York; *Treasurer,* Ernest E. Smith, Canajoharie.

Executive committee. E. M. Sanford, Argyle; E. F. McKinley, Freeport; W. S. Steele, Olean.

The president directed that one ballot be cast for the above nominees, who were declared elected unanimously.

COMMITTEE ON RESOLUTIONS

Principal D. C. Farr, for the committee, presented the following, which were unanimously adopted:

Resolved, That the thanks of this conference be extended to the Syracuse Board of Education, Superintendent Blodgett and Principal Wickes for their courteous hospitality in allowing us the use of the auditorium of their beautiful high school for the different sessions of the conference and for other favors.

Resolved, That our thanks are due to the different papers of the city for publishing complete accounts of our meetings.

Resolved, That in the judgment of the conference great care should be exercised lest the work of our secondary schools become superficial through a too greatly expanded curriculum.

Resolved, That the greatest possible effort should be made that thorough instruction be given in the fundamental branches of an English education, and that specialization in the high school should be discouraged.

Resolved, That the thanks of the conference are due to President Rhees for his able, sound and helpful address.

Resolved, That in the opinion of this body all organizations connected with our schools should be under the control of the school authorities.

Resolved, That the thanks of the academic principals of the State of New York are due and are hereby tendered to Gov. Benjamin B. Odell for his wise and earnest efforts for the advancement of education in this State.

Resolved, That we heartily approve the proposition that the tuition of nonresident pupils in academic grades be paid by the

State, and that we urge on the Legislature the importance of appropriating funds and perfecting the legislation necessary to put the same in execution.

Resolved, That hereafter the second evening of the meetings of the conference be devoted to social functions.

Resolved, That in the opinion of this body college authorities should use all reasonable efforts to reduce the necessary expenses of their students.

Resolved, That a committee of three be appointed by the president to make arrangements for the proper observance of the 20th anniversary of this organization.

PLAN OF PROCEEDINGS

The committee appointed last year to devise a plan for increasing the interest and efficiency of the meetings of the conference reported through Principal Farr as follows:

We think the work has been accomplished, and you have had an example of it in the sessions of this meeting. It was thought that the conference had become so large that it would be impossible to maintain interest unless the widest opportunity was given for free discussion, and we recommended that no more than one formal paper for each session be presented; that a topic should be selected by the executive committee for each session; and that there should be also a considerable number of optional topics from which the members might select those that they wished to have discussed. This in brief is our report, which, as you see, has already been carried out with a good deal of success; and we would recommend that this plan be adopted in the future, being amended from time to time as exigencies require.

The report of the committee was accepted.

GREETINGS

The committee appointed to carry the greetings of the Associated Academic Principals to the other educational bodies in session reported that they had transmitted the following communications:

To the Science Teachers Association

The Associated Academic Principals send greetings and earnest wishes for success in efforts to solve many of the educational problems.

To the Association of Grammar School Principals

The Associated Academic Principals send greetings and congratulations on reaching the end of a decade of effective educational study.

To the Conference of Training Class Teachers

The Associated Academic Principals send greetings. May the efforts to improve the educational work of the members of the training classes be abundantly successful.

Th following communication was received from the grammar school principals:

To the Academic Principals Association

GREETING: We the Grammar School Principals Association in convention assembled hereby acknowledge the receipt of your communication of the 30th and desire to reciprocate by extending to you the cordial greeting of the Grammar School Principals Association

C. E. LAWTON
M. A. ROOT } *Committee*
S. C. MOULTHROP

ADDRESSES, PAPERS AND DISCUSSIONS

Monday evening, December 29

President Frank S. Fosdick — It is a question in my mind who should be the subjects of congratulation this evening, whether the Associated Academic Principals, privileged to hold their 18th annual session in this magnificent room, or the citizens of Syracuse in having so august a body as this to dedicate, in a way, the building. On the whole, I think we shall have to congratulate the latter; for, while the visiting principals will come and go, carrying with them only memories of a building superb in outline and magnificent in proportions, Syracuse will be ever conscious of an influence at work in the midst of it that tends to higher culture, a better appreciation of the beautiful, a truer civic life. Therefore, in behalf of the Associated Academic Principals, I congratulate the city on possessing so complete a high school building. Through the generosity of the authorities, all of our meetings will be held in this room; and so far as it rests with the presiding officer, will begin on time and close with equal promptness. The next session will occur tomorrow morning at 9.15 sharp.

We have with us tonight one who has shown his interest in our association and in all the diverse lines of secondary education by his presence and by his words of counsel. It gives me great pleasure to introduce to you Pres. Rush Rhees of the University of Rochester, who will deliver the annual address on the subject, "Thoroughness versus Breadth."

THOROUGHNESS VERSUS BREADTH

BY PRESIDENT RUSH RHEES, UNIVERSITY OF ROCHESTER

Ladies and Gentlemen: I can not face such an audience as this without doing what is always against my principles, making a word of apology; for I always feel that, in coming to speak to those who are actively engaged in the work of education in what we sometimes call the primary or elementary or grammar grades, there is an element of impertinence in anything that I may have to say, for I never had the fortune to teach in that grade of education that you are occupied with. Therefore any words that I may have to offer by way of suggestion have in them the possibility of that arrogance and self-confidence which come to those who have not experience of the actual difficulties and demands of a given line of work. So far as it is possible for one by the exercise of imagination to rid one's self of such arrogance, I declare to you I have studiously endeavored to do so. With so much of plea for your leniency of judgment and with expression of profound respect for your larger and more perfect knowledge, I will ask you to consider the few words that I have to offer tonight.

In presenting this well worn topic, let me say at once that I hold no brief for the older less varied curriculum which seems to be the ideal of some parents and teachers; for I am fully convinced of the educational value of the new learning, if I may so designate those studies in literature and science the worth of which is often challenged by critics of our present education.

By way of definition, let me say that by breadth I mean to refer to the enrichment and enlargement of the high school curriculum which have come with the introduction of new studies in science and literature, together with new studies of a supposedly more practical bearing on the business life which most of the pupils are shortly to enter.

These new studies have been introduced in response to three different demands: a demand for a wider culture, for a more practical training, or for a fuller preparation for college. Of these three, that made in the interest of a wider culture is undoubtedly most responsible for the multiplication of high school studies, though the advocates of what is regarded as practical education have urged a demand hardly less insistent. The colleges also have increased their entrance requirements, sometimes placing a heavy burden on high schools.

For the colleges it may be said with clear emphasis, that we are far more interested in what a student can do than in the number of things he has studied. The entrance requirements mean to us incidentally that students are ready to pursue advanced work in language and mathematics and other kinds of learning, building on the studies covered in the preparatory course. The requirements mean to us chiefly, however, that the student has attained a stage of intellectual maturity and a possession of his own intellectual powers which fit him for college work, in company with other students equally disciplined and prepared. The introduction of courses in Greek for beginners at Harvard, Yale, Bowdoin, Brown, Smith, Vassar, Bryn Mawr and elsewhere indicates how far the present tendency in college requirements has swung away from rigid insistence on the traditional classical training. Of that classical training something will be said later. Now it is enough to say that our present anxiety concerns the securing of a preparation for college work as thorough and effective as that which results from the traditional classical education. The college demand is not hostile to the broadening of high school work. Hostility would be ignoble, if the colleges were in a position to dictate the high school curriculum; it would be futile in view of the small fraction of the high school constituency which looks toward a college course. On the contrary, the colleges year by year announce increasing readiness to recognize as means of preparation for entrance new studies in the modern languages, in science, in history. And they have been the allies, if not the leaders, of those who have sought to secure more worthy study of English — both the language and the literature — in our preparatory and high schools. But, as

I have said, the colleges care more for thorough training than they do for the particular subjects studied in pursuit of that training.

For the advocates of what is called practical education, I may not presume to speak so confidently. Some things are made clear however by the attitude of business men and manufacturers toward the so called practical training offered in schools. We need not heed the frank contempt of men who give small thought to the possibilities of preparing students in schools for work in offices or factories. We may rather note the fact that those who welcome every such attempt rationally conducted, agree that the technic of any business or trade is to be learned best in the office or the factory. Experience there means more for the boy who is seeking employment than commercial courses in school. I am referring now to what President Hadley would probably call technical studies in high schools. For professional engineers certain kinds of training in technical schools are indispensable for the highest advancement in industrial leadership. Yet engineers, like all the rest of us, have their largest lessons to learn in applying their knowledge to practical ends while actually doing their share of the world's work. That which is of most worth to them is not their drill in technic of engineering, but their grasp of fundamental principles of science and their knowledge of life and of intellectual processes.

Of this, the significance for our problem is that that education is of most value which turns out the best thinker. Practical men are eager to take into their employ pupils from our schools who know well the fundamentals of expression and of reckoning. If to these there is added familiarity with some of the common methods of accounting, or the use of tools or other technical detail, well and good. But our business and industrial leaders do not want machines adjusted to a certain task, to be done in a certain way; they want minds capable of clear and prompt thinking, able to adjust themselves quickly to new situations as they arise. I am not opposing instruction in commercial arithmetic, bookkeeping, typewriting, shopwork and the like. I could make a strong plea for some of them. But I am calling attention to the fact that practical men agree with the colleges in asking the schools first of all to give them boys and girls who can *think*, who know to some extent their own powers, and are able to see into a simple problem when they meet one and to find a way of solving it.

In the interest of culture, all thoughtful men must say much the same as I have said on behalf of the colleges and — perhaps presumptuously — for the advocates of practical training. That school does not give its pupils the broadest culture which furnishes them most abundantly with information on many subjects. The old custom of giving "fourteen weeks courses" in half a dozen sciences, and cursory surveys of the broad field of literature, with quotations of striking passages, failed signally of securing real culture. The simpler and more interesting results of scientific research may be learned by reading entertaining books about the evening lamp, by following the pages of the *Scientific American,* or by watching the columns of our modern voluminous dailies. Out of school this information may be got really better than in school, for each year sees such learning modified if not quite superseded.

The culture value of the study of science or literature in school consists in some mastery — however slight — of the subject and its methods. A year of physics in a high school, wisely directed, will show a student the beginning of the meaning of physics, and will give him an idea of how to think about a physical problem and how to go about its solution, which is worth ten times over any number of short courses of text-book work and teacher's desk experiments in a half dozen sciences. At the end of the year he will not have become familiar with as many things, but he will know a great deal more. And this larger knowledge will fit him by himself in cursory reading to learn and understand far more of a half dozen other sciences than all the short courses conceivable could give him. Such a year of discovery of how little he knows and of how difficult the gaining of real knowledge is will give him a respect for all scientific work, which will deepen his interest, enlarge his reverence and insure his sanity of judgment.

What I have said of science is true of all other learning. If the interests of culture ask for the introduction of new subjects in our schools—and they make a quite valid demand—they assuredly ask for something much more respectable than a smattering of many things with scant appreciation of their significance.

These considerations lead naturally to the inquiry, What does thoroughness demand? In answer let me emphasize three essentials of any education which would be thorough.

1 It must provide for consecutive work; that is the pursuit of a given subject — or what is practically one subject — for not less than a year of daily work, preferably for three or four years. Here is the real service rendered to high schools by the college entrance requirements. To take up college Latin a student must have been at work on Latin consecutively for four years; the Greek requirement means three years' work; the modern language requirements call for two or three years in each language; the mathematical requirement demands *at least* a year of algebra followed by a year of geometry; while in history and in such scientific work as is accepted the demand for consecutive work continued not less than a year grows ever clearer. This is not an arbitrary requirement. Colleges regard this work seriously and feel compelled to ask that students who undertake it have some acquaintance with serious work. So far as the colleges influence the high schools, therefore, they accent emphatically the demand for consecutive work.

The demand is not arbitrary, I say, because a student's knowledge of a subject grows in an accelerating ratio as he lengthens his attention to it. A few weeks may be spent on a science, or literature, or a period of history, without bringing to the student's consciousness any sense of the significance or the method of the subject. He will be occupied — and either wearied or entertained according to his idiosyncrasy — with the common facts of the subject. It is when he has passed beyond the recounting of familiar results, and problems offer themselves for study, that the student begins to sink his intellectual plummet deeper, and to learn not only more of the subject, but more of his own power and weakness in dealing with it.

The demand for consecutive work is further justified by the fact that a student's sense of the significance of knowledge grows in proportion as he finds himself confronted by the difficulties and intricacies of some task which he is set to perform. For practical life, that which is of greatest importance for a man is that he shall quickly recognize what his day's problem involves, and shall be able clearly to decide what it demands of him and what he can do with it. Unless in school the boy has come to be something more than "a picker-up of learning's crumbs," by carrying some piece of work through to relative mastery, the school has failed to fit him for these later and more serious problems.

2 A thorough education calls for individual work which demands some measure of independent thinking. This second essential is in fact but a corollary of the first, for the value of consecutive work is that it does call out individual thinking. Yet I believe that the experience of many of us will testify that we were left too free from the demand for our own independent thought. We leaned too hard on the answer set at the end of our problems in arithmetic and algebra, followed too slavishly the rules and sample demonstrations. It is the boast of the new learning, specially the study of science, that it has forced the laboratory into the schools. It is a valid boast in so far as in the laboratories the students are compelled to trust their own senses and record their own results. In this demand for individual work the new learning joins hands with the old-fashioned discipline of exact and independent translation from classical texts. Both that old and the new discipline are now joined in the demand for independent work by the newer method in the oldest of sciences—mathematics. The growth of insistence on the original solution of problems, or demonstration of theorems of which only the statement is given, is evidence of increasing recognition of the demand for thoroughly individual and independent thinking.

Not all subjects lend themselves as readily to such independent work as do sciences, classical texts, and mathematics. Yet history and literature may offer opportunity for the exercise of the power to analyze the elements of a living situation, and to bring known facts and principles to bear on it for its explanation. An education which is ambitious to be thorough will find opportunity at all times to challenge individual thought and call out independent opinion.

3 A third essential in a thorough education is the clear expression of the results of work done. President Hadley seems to believe that this power of clear expression was more highly regarded formerly than it is now, and he instances the departure from the rigid formality of Euclidian demonstration in geometry. I am not sure that the laboratory method does not at first encourage carelessness concerning clear expression, being content if only results be correct. Undoubtedly there have been and are men who can express their thought clearly and adequately only in some form of work done. Our modern interest in manual training is evidence that we are recognizing that all work is a form of expression of ideas. Yet the few who can think clearly and give effective expression of their thought only in work done, would be more effective could they also state in simple, transparent language the idea they have put into form; while the mistaken many who try to hide careless thought behind the plea of inability to express themselves adequately will owe a debt incalculable to any teacher who will force them to set their own half formed and inconsequential idea before themselves in naked speech.

The demand for thoroughness asks teachers now to pass a demonstration in mathematics which shows correct results but omits essential steps in the process, to insist on a student's stating the whole process with logical and rhetorical completeness; it asks teachers to insist on clear and felicitous translations, and to suffer no student to labor under the impression that he understands a foreign sentence when he has caught some faint glimmering of a possible meaning for it. I had a rare and merciless teacher once who would listen to his student's floundering efforts to put a Greek clause into English, and, when he had struggled long enough to have discovered his own ignorance, the teacher was wont to remark with a twinkle in his eye, "You got the tail feathers of that idea, but the bird got away from you." Moreover, if the advocates of the laboratory method desire to show the skeptical what an excellent logical discipline it may be, they can do so in no way so surely as by adopting the old disheartening dictum some of us used to hear, "If you can't express it, you don't know it." For the great majority of students, exact thinking waits on clear statement.

We do not know what we think till we try to tell it. We only discover some of our own absurdities when we state them in order to defend them. The school does a student an injustice if he leaves its halls without long familiarity with the demand that anything he may have to say be said clearly and truly.

These three essentials — consecutive work, individual thinking, clear expression — constitute the apology which thoroughness offers for lifting up its voice amid the new invitations which our greatly widened horizon of knowledge issues to our schools and to our youth.

Let me assert again that such thoroughness is no foe to the new learning. The old strife between the classicists and the advocates of science has obscured our vision somewhat. The defenders of the old training have made discipline their shibboleth, and thoroughness their idol. And they have had much justification; for whatever the classical training failed—or fails—to do, it made—and makes—*thinkers*. The professor of biology in Rochester, himself not a classicist by training but an ardent devotee of science, confesses that he can not explain the fact, any more than he can deny it, that the students who take hold of laboratory problems and adopt laboratory methods most readily and effectively are those who come to him from the study of Latin and Greek. We have no notion that Greek root or Latin syntax holds a magical key to all forms of knowledge. The valid foundation for the classicists' claim has too often been obstructed under an insistence that culture must build on the attainments of Greece and Rome. Within a few months the Nestor of Massachusetts's politicians has voiced this sentiment with rare beauty and affectionate retrospect. Our generation, however, faces tomorrow more eagerly than yesterday. We are readily impatient of tradition. While much could come from my heart in the way of plea for the refinement of the old culture, I will not permit myself to obscure what I believe to be the chief validity of the claim of the older curriculum. It gained and has its hold because it trained students to do clear, continuous and valid thinking, and to give that thinking plain, true, effective expression. This is what thoroughness asks of our modern schools; and, in advocating it, we may set aside entirely all question concerning the studies which seem to beget such forceful thinking and clear expression.

Yet there is a limit which thoroughness would set to the so called broadening of our school work. It would check dabbling. The world today is even for the young a wonder book surpassing all classic myths and childhood fables. This very fulness of marvel is our danger. We would have our children learn about botany and physics and chemistry and storms and climate and economics, theory and psychology and far more things than Horatio's philosophy dreamed of. Our constant temptation is to dabble. The student would flit hither and yon, butterflylike, sucking the sweets out of all these flowers gleaming. Our school authorities are often caught with a passion to advertise a *broad* curriculum, and therefore seek to introduce a little of this and a little of that, a few weeks of botany, a few weeks of physical geography. With fullest respect for the dignity of this new learning, and for the possible value for thorough education of any one of these new tempters, thoroughness lifts up its voice and pleads for moderation. It would have two limits recognized:

1 *The limit of decent efficiency.* For the old learning a quite meager apparatus sufficed, and efficient teachers were not hard to find. For the new learning the good teacher is rare, and the adequate equipment is costly. If a school can find the teacher — and they are growing more plentiful — if it can supply the needed apparatus, then it owes it to its students to give them the opportunity to gain power to think clearly and to express their thought effectively by means of the new learning. It hardly needs to be said that the rare teacher is of more importance than the costly equipment. The good teacher can make a good laboratory out of most unpromising material. Elaborate apparatus is worse than wasted if it is not used efficiently.

Obviously this plea for moderation is addressed chiefly to the schools of smaller communities, where resources are limited. When one visits the laboratories of such noble schools as are now growing up in our cities, one has no apprehension that the new science will be slightingly taught.

2 There is another plea for moderation which concerns schools small and large alike, and probably concerns the large schools

more vitally than the smaller ones. It is that they recognize the limit of *real advantage to the pupils.* The temptation to expand and add new subjects sometimes carries our schools beyond the natural bounds of adolescent life. I know a school which boasts an eminent teacher in literature. He is a man of rare culture and profound insight. Yet he lacks sympathy with the limitations of youth, or he would not send boys and girls of 17 or 18 home to meditate on the spiritual significance of some of Robert Browning's profounder poems. I do not underestimate the idealism and spiritual insight of youth. But, if there is a poet who does not sing for the adolescent years, but for men and women who have drank much of life's cup of delight and bitterness, it is Robert Browning. Boys and girls of sensitive nature may imagine that they appreciate the poet's passion and inspiration; but in the measure in which they do so they are spiritually maimed and wronged. Some things belong to the years of youth, and some do not. The man or woman who elects to teach youth, chooses a most exalted life; but he must not expect to have his teaching and his own life's interest run in open comradeship. He has become a servant. Every deepening of his own spirit — by following the lead of Browning or any other prophet — will enrich his power to help the youth he serves; but them he must serve, with supreme reverence for their years and their right to take life's lessons in life's normal order.

I have instanced this case which came under my observation. Literature is not the only subject which properly calls for recognition of the limits of real advantage to the pupils. I believe that the committee of 10 did wisely in advising that economics be omitted from the high school program. Psychology would need to be taught by a wise man to have its place in those early years. Similarly, in those sciences which fitly find a place in high schools, teachers need to recognize at every turn the limit of real advantage to the pupils, in selecting the work to be done, and setting bounds to it. I know a school to whose manual training equipment there has been added by most generous impulse one or two pieces of apparatus for testing the strength of materials. Such apparatus is meant for work for which students become ready only after many more years of training in the course which looks toward engineering. For younger students its presence may be vicious in encouraging in them a vain impression that they know what the apparatus is meant to teach. I think that we are suffering from a lack of recognition, on the part of some teachers, of the limits which the age and stage of maturity of their students set to the things that may wisely be taught them.

We all need to learn the dignity and high respectability of thorough work, done in a range of subjects as wide as our resources and the nature of our students will make practicable. Dabbling is always vicious. The small school should not blush in the presence of its large city comrade. Too many leaders in the world's life have come from small schools and proved the efficiency of thorough, even if narrow, training to justify that blush. Ambition does well to seek after ever broadening culture; but greater than this is thoroughness of work in the widest range of subjects that is honestly practicable.

The message then is simple.

1 In planning your work, seek first of all thoroughness as far as you go, that your students may gain the priceless power to think clearly, continuously, validly; and to express themselves plainly, truly and effectively.

2 Broaden your work by taking on the new learning as much as you can and do it thoroughly.

3 If the demand for more informational studies seems imperative, add one or two and make it plain that they are for information only, for the purpose of widening the student's horizon.

4 Remember, and help the student to understand that, if you train him to be a thinker capable of clear expression, his broadening knowledge will readily take care of itself; while, if you turn out a small walking encyclopedia, he will soon be out of date and gathering dust on the shelf.

Therefore let it be a prime determination to give students as rich an education as possible, but at all hazards to train in them the power of clear, consecutive, valid thinking, and plain, true, effective expression.

Tuesday morning, December 30

THE HIGH SCHOOL IN ITS RELATION TO COMMERCIAL EDUCATION

BY SUPERINTENDENT EMMET BELKNAP, LOCKPORT HIGH SCHOOL

In attempting to prepare a consideration of the topic that has been assigned me, I have been in doubt as to whether it is better to approach it from the side of practical experience and the standpoint of personal observation, which perhaps would be the more pleasant and more practicable thing to do, or to attempt to approach it from the standpoint of educational theory, with the purpose of having something fundamental, something sufficiently coherent to form, perhaps, a basis of discussion. I have decided to adopt the latter view, feeling that you yourselves will be able in the discussion to develop the practical side of the question if you desire; and also that I may be able to introduce in the argument the expressions of some who have thought broadly on the subject, expressions which are more worthy of consideration than anything I can personally offer.

In considering this topic we find it important to inquire, what is meant by the term, "commercial education"? What is the province of the public high school in the general field of education? In what way and why does the relation of the school toward this phase of instruction differ from that of all or any others?

I assume that by commercial education we mean all of the knowledge and facility that may be given or acquired in schools, as a more or less direct preparation of individuals for successful participation in business affairs.

The conception is more comprehensive than that formerly held of commercial education, but is more in harmony with the ideals and spirit of the present time. It therefore includes the general, as well as the special instruction essential or highly important in the training of the business man or woman, and may be considered from essentially the same basis and measured by the same standards as are applied to other departments of educational effort.

It gives a point of view not furnished by the narrower conception that commercial education consists chiefly of the acquirement of a rather small amount of elementary and more or less theoretical knowledge of business transactions, records, law and correspondence, and some degree of facility in business office routine, making some application of English and arithmetic, employing handwriting, and — optionally — stenography and typewriting, these to be learned sufficiently at school to enable the possessor to fill some subordinate position, and to be extended and more or less perfected in actual business experience; though it assumes that these still represent some of the directly practical features in which instruction and training are to be given.

The obvious function of the high school is to provide, for all who are entitled to share in it, adequate opportunity for good secondary education, through such desired branches of instruction, to such extent and in such manner as the state and the community, which support the school, shall from time to time determine to be essential, or sufficiently important, in training their young citizens to personal and civic usefulness.

President Hyde, of Bowdoin College, aptly says, " Education aims to fit for three things: to earn a living, to support the institutions of society, and to enjoy the products of civilization." Commenting on this, Inspector I. O. Crissy says in his address as president of the department of business education, National Educational Association: " It will be observed that the first branch of this triad has to do with a man's necessities, the second with his citizenship and patriotism, and the third with his capacity for enjoyment." He further says: " Such an education must have that foundation in general culture which is the first stepping-stone to the accumulated experiences of mankind." The school then should assist each student to realize for himself the highest degree of such a consummation that his capacities and circumstances will enable him to attain, regarding not only the early, but still more the later efficiency of the individual. Its aims and methods must be both practical and uplifting.

We are also told that education is " adaptation to civilization," and that its instruments react on and influence their surroundings, and so, they themselves become, in a sense, makers of civilization. The high school then, as so universally touching and reacting on the life of each community, must be a fountainhead of knowledge, a source of culture, and an active, not to say aggressive, influence in the formation and expression of liberal, progressive spirit.

In our expanding life, the view of the province of public education has so enlarged that it now looks out over the broad field of the public welfare. From kindergarten to university, opportunity is extended to the individual. The state provides and supervises till most states supply or encourage, by the expenditure of public funds, generous preparation, not only for the professions, but for other forms of specialized and highly remunerative activity.

Dr DeGarmo says:

> Once, academic and higher education was a professional preparation for a few restricted callings and, like all professional education, dealt with things of vital interest to those who were pursuing it. Now, academic and higher education is a preparation for the higher stages of all callings. It is the proud boast of engineers that they will soon be the best educated professional body in existence. Not only has the university expanded to meet the needs of mechanical, electrical, chemical and civil engineers, but it also provides higher education for those who follow agriculture, horticulture, forestry, architecture, or any department of pure or applied natural or social science. Once the humanities were represented by the ancient languages and the history of philosophy, but now they are equally well represented by modern languages, by literature and art, and by the marvelous developments of modern historical science. The modern university, in short, now furnishes knowledge and efficiency in practically all human sciences, the natural sciences and the economic sciences. Among the latter, the higher commercial studies are the latest to take their rightful place in the sisterhood of sciences.

I also quote from the address of Mr J. M. Anderson, before the National Educational Association, at Minneapolis:

> Most of our states are now offering facilities for young men who wish to enter the learned professions. The law, medicine, and theology are deemed worthy of assistance, and the young men who enter these professions find avenues of preparation open to them. In view of new conditions and our rapidly widening national horizon, are these professions more important in their bearing upon our future than the intelligent fostering of our productive forces? Of the male population engaged in gain-

ful occupations in this country, only a little more than 1 per cent are in the learned professions. The other 99 per cent find their way into and are absorbed in, our industrial system. For this 99 per cent we provide the common schools and our colleges. It is safe to say that at least 95 per cent never get farther than the common schools. Every state in the union should provide for her sons and daughters the highest possible form of instruction adapted to the special industries of that state, and should open to her citizens, without tuition fees, the opportunity for the highest possible attainment in these special lines.

This technical and commercial instruction might begin in our high schools, the courses to be elective, and to lead directly to departments of commerce in our great universities, so that the young man who plans to enter the great mercantile institution, or to engage in railroading, commerce or manufacturing of any kind, may fit himself with all the accurate scientific knowledge obtainable upon the special department of usefulness which he purposes to enter.

In this last analysis the prosperity of the state must rest upon the intelligence of her citizens. If that intelligence be so fostered by the state as to contribute directly to the capacity for production, she has at once served the best good of her citizens and her own highest interests.

The high school, in common with other institutions has come upward through a great development. Its recent growth has become one of the significant facts of our educational progress. Having established its right to be, it should show eagerness to fulfil the promises of its greater destiny. The demands made on it have indeed been considerable. The scope of its instruction has been so extended, its courses of study been so enlarged, enriched and differentiated, its equipment and facilities have been so increased, that its organization and administration have become increasingly complex and difficult. In attempting to do so much, it is sometimes criticized as doing but little very well. But its evolution is not yet accomplished, and it now seems that progress requires some adaptation to the latest phase of our expanding life.

In many of our larger cities special commercial high schools have been or are about to be established. Universities and other special schools of similar rank are now providing higher courses in commerce and finance. In some of the academic high schools extended commercial courses are being developed and admitted to equal fellowship in the curriculum.

We all know how the foresight and practical energy of the Regents of our University have in recent years taken hold of the field of private and public commercial instruction in this State, have secured cooperation, have made the work more liberal, as well as more definite, have outlined profitable courses of such instruction, and have supplied accepted standards of attainment.

From the standpoint of our definition and from the trend of events, the public high school, it would seem, has somewhat directly to do with commercial education. The extent and manner of its doing are to be worked out, and must depend largely on local needs, demands and circumstances. While the special and larger schools may endeavor to prepare young men for many phases of business activity in private and public service, others must be content to supply good general education, made as purposeful as possible and, when needed, as much as practicable of the special training required by individuals compelled to go immediately from the public school into positions of business effort that enable them to earn their own support, there to advance as they may be able in the competitions of active life.

The possibility of giving successful commercial training in schools has been abundantly established in the history of both private and public institutions. But, as it is still questioned by some, I quote from a summary that I find in the report of Superintendent Griffith, of Utica, for 1901. He says:

> It may be well to state here some of the chief reasons that had weight with the school authorities in leading them to establish a commercial course in a free, tax-supported public high school. Two questions met us at the outset. (1) Is business training possible in schools? (2) If so, is such training legitimately within the province of public schools? Upon the first of these questions it was remarked: (*a*) The history of training for theology, law, medicine, teaching, architecture, engineering and mining recounts the development of each from the apprentice, or merely imitative system, to systematic, scientific instruction in schools as an important and economic preliminary to practice. Business seems to be the only great field of activity, other than merely manual work, where the old idea is still strongly upheld. (*b*) "To deny that young men may be syste-

matically trained for industry and commerce is to assert that industry and commerce are merely imitative arts, to be acquired only by seeing other people do the tricks and then practising them," says President Eliot. Few are ready to admit this alternative. (*c*) The fact that thousands of graduates of the short and confessedly inadequate courses of the business colleges are sought and employed by every business man shows what many such business men practice, whatever they may say about it. (*d*) The conclusion seems certain that there is a large amount of information, and a certain kind of training, of special application to a business career, that can be taught in the schools, that business is to a degree scientific and capable of being taught, and that the business world is calling for such schools and courses.

Again it has been urged, and with some apparent reason, that this "certain kind of training" is a department of education distinctly belonging to the field of private instruction. In the high school we have frequently held to the opinion that this body of knowledge and facility in the conventions of business office routine are of small content, may easily and quickly be learned by young persons of fair general education and ability, and, therefore, because so directly utilitarian in purpose and method of attainment, are not entitled to encouraging recognition in the curriculum nor to high rank in the scale of educational values, and should pertain to the domain of private, not public, instruction.

We are told by some that, where they have been adopted, they have not been highly successful in result. In extension of this argument, I quote from an address by T. W. Bookmyer of the Sandusky Business College, Ohio, at the meeting of the Federation of Commercial Teachers, at Detroit, in December 1900:

> If then the thoughts of the closing century are in the direction of commercial education, it is most fitting that we come together upon this question and discuss the relation that commercial education bears to the older and more clearly defined forms. In entering upon a discussion of this subject, there are two propositions that confront us, both of which are worthy of consideration, and each commands a host of supporters. The first is, that commercial education is of such general utility that it should become a part of our system of public education, and that it should be the duty of the state to provide for the instruc-

tion therein. The second is, that it is special in its very nature, professional in its intent, therefore wholly without the scope and purpose of public education, and should be provided for at private expense. If we accept the former as the true status of commercial education, then we have but to discuss the means and methods to be adopted in instruction through which the best results may be obtained. Instead of its being related to public education it is an integral part of it. The only problem then would be to make it harmonize with our present high school course, by interweaving it with other subjects, so as to escape censure on the one hand, and meet the demands of the business public on the other.

I hold that commercial education should not be made a public charge, nor be provided at public expense. It is the only logical conclusion that can be arrived at after careful thought. The line must be drawn somewhere, and its true location is between the general and the technical. If it is made a public charge, where can you stop? There are dozens of other subjects that become more general than is commercial education.

The very nature of the work precludes its being made a part of the high school course with any degree of success. It is a subject that must be pushed to completion as rapidly as is consistent with good work. Interest is lost in delays, and the best results are always obtained only by continuity of thought. To sandwich it in with the regular high school subjects would be to break up this continuity of thought by associating it with subjects absolutely foreign to it, both in pursuit and application. Many of our high schools have attempted it, but it has been abandoned by some of them, and has not passed the experimental stage in any of them.

Dr Winship, of the *Journal of Education*, says:

The modern commercial school or department must give the student a commercial vocabulary, commercial and industrial geographical information, accuracy in number and spelling, and cleverness in seeing what is meant without requiring explicit directions for everything, in addition to bookkeeping, typewriting and stenography.

The commercial school or department is a necessity because the elementary public school lacks appreciation of the distinction between accuracy and thoroughness, practice and drill, alertness and percentages, the geography of life and of tradition, because the secondary school lives largely in what has been rather than what is, reverences the classic rather than the forcible, discipline rather than power, ability to tell what he knows rather than to know something worth while to tell.

This is not intended as a criticism of the elementary or the secondary school. The statement of the same general facts could be so made as to show that good results from the mission and the method of these schools, but all public schools have failed to appreciate that business life today requires specific training in accuracy, alertness and cleverness, and that these require practice and skill in a special field of effort. The commercial school must not reverence the classic or the artistic. The very elements that the public school can not magnify must be promoted here.

It may be prudent to admit that this instruction must of necessity fail in high schools, if carried on in an unsympathetic atmosphere, without appropriate opportunity and equipment, and intrusted to teachers who have not the necessary interest, training, or business point of view.

I quote again from the report of Superintendent Griffith:

> Assuming then that such training is possible and in demand, the question arises, is it legitimately within the province of public schools, and, if so, can it be given to any reasonable extent in the city high school? Upon the first part of this question, the following seemed to have strong bearing. Professor Herrick, of Philadelphia, says: "A likeness must exist between the dominant institutions of society and the educational provisions which the same society makes for its well-being. Whether we approve or not, this is essentially an industrial and commercial age, and whether we will or no, a new element is being introduced into modern education. The school can not create the tendencies of the age, and therefore will do wisely to adapt itself to them."
>
> Again, the distinction between the so called cultural and practical studies is rapidly disappearing as better teaching of the latter is showing their cultural value also. Professor Thurber of Chicago University, strongly affirms: "It seems to me that the day is past when one who discusses this question sincerely and earnestly is in danger of being reproached with mere utilitarianism and being exiled beyond the pale of true and high educational thought. It is surely high time that the gulf between theory and practice, the chasm between the utilitarian and the cultural, the yawning abyss between the liberal and the technical, the spacious void between education and life, should be not merely bridged over but filled in. We have had far too many dead lines in education. The world is not all mind, life is not all discipline, and it is time here and now for the educator to accept fully and practise highly the doctrine that to him *nothing that* is human is common or unclean."

Whatever, then, the chief lines of activity of a community demand of its members may well be prepared for in its public schools, whatever its safety and general good demands may well be supplied at public expense. The time has passed when those who are in control of education may hesitate to introduce a study into the curriculum upon the basis of its practical value in the after life of a reasonable number of students.

Inspector Crissy says, in his address as president of the business department of the National Educational Association, at Minneapolis: " I believe that the great fountainhead of business education for the masses of the people is to be found in the four year commercial course in the public secondary school."

If we accept this view, it remains for us to determine how the proposed work may best be related to or pursued in connection with other things. I do not infer that courses of study or details of organization are essentially within the province of this paper. It is to be admitted that an education obtained in the public schools, concluding with a four year high school course, is, at best, a modest preparation for the active duties and enjoyments of life. It should be extended when possible, and no intervention of the school, when it and added special training can be obtained, should prevent it.

There must also continue to be a useful and remunerative field for the private commercial school; and, the better the foundation work and ideal of the public high school, the broader and better that work must of necessity become.

The place for a commercial high school course is preferably in a separate commercial high school, with its appropriate aims, atmosphere and equipment. Where it must be provided in the ordinary high school, there should be a specially equipped and privileged department, where the kind and quality of teaching, and the rapidity and continuity of thought and acquisition mentioned as so important may be properly secured. The degree of connection of commercial with other work, or of its separation, can be arranged to meet local views. With such opportunity and recognition there should be limitations and restrictions to maintain a high standard and interest in all of the general as well as special work and to safeguard the interests of the high school. Purely commercial studies should not be permitted to dominate the student's effort, at least till a time when it becomes imperative because of certainty that his opportunity of attendance must soon and permanently cease. While the related work may be done under the regular high school teachers and classes, that which is special must be intrusted only to such properly trained teachers of commercial branches as would be employed for such specific work in the best private commercial schools. Where right equipment, facilities, program time limit, and teaching can not be steadily secured, more modest work may of necessity be attempted, and can be made moderately successful.

As to the content of a four year commercial course, many suggestions have been made and some tentative programs offered. Some have attempted statements of principles on which intelligent choice of subject-matter should be undertaken. A committee of nine, of the department of business education of the National Educational Association, appointed in 1901, has this matter under consideration and will probably make a definite report at the Boston meeting. It seems safe for us to infer that the course or courses outlined will be inclusive, flexible, and to a considerable extent elective.

Inspector Crissy further says:

> There must be first and foremost a careful study of English, that the student may hold the key to all the other studies and be able to express his thought clearly and forcefully; there must be a study of history, that he may see clearly what the race has been and what it has done — its failures and accomplishments; a study of physiology and hygiene, that he may know his body and how to keep it sound, as the fitting casket of a sound mind; a study of geography, to broaden his mind, through a knowledge of the vastness of the earth and of the variety of its peoples and its products; a study of civics, that he may appreciate the principles and administration of the government by which he is protected and be able to compare it with the governments of other countries; a study of some foreign language, which, aside from its practical value for actual use, will add much to that mental discipline so necessary to quick and accurate thought; a study of mathematics — arithmetic, algebra and geometry — to develop the power of exact reasoning; a study of economics, that he may become acquainted with the underlying principles of trade and the foundations of national wealth; a study of the best literature, that his imagination may be broadened, and there may be opened to him the keenest enjoy-

ment of the products of art and civilization; and, finally, a study of the sciences — physics, chemistry, biology and kindred subjects, not only for their practical utility, but that in the field and in the woods and in the retirement of the laboratory he may acquaint himself with nature's laws, wrest from her her most intimate secrets, and thus be brought into closer harmony with the Great Creator of the Universe. If, to the foregoing we add a competent knowledge of bookkeeping, commercial paper and business forms, as complete a study of business practice and methods as can be made in a secondary school with proper equipment, a study of commercial law covering the subjects of contract, agency and bailment, in their application to ordinary business affairs, a study of drawing, shorthand and typewriting, and business correspondence, I think we shall have satisfied pretty fully the comprehensive triad of President Hyde, and furnished such an education as should make a self-supporting and valuable citizen.

Dr De Garmo, in an address before the Eastern Commercial Teachers Association, in March last, after alluding to the prevailing conception of the inferiority of commercial, as compared with classical and other literary education, proceeds to consider whether that conception is well founded, and later, to indicate the basis of a commercial education that justly can not be called inferior. He says:

We should first make a distinction between ideas that are merely clear and those which are also vivid. A clear idea is one that produces inner illumination without a tendency to release energy. It shows us the likenesses and differences of things about us. but does not stimulate us to do things. A vivid idea is one that tends to pass into action; it pulsates with the feelings that attach themselves to vital interests. Clear they may also be. but the predominating quality of vivid ideas is their tendency to motor expression. Their function is to effect results in the world of events. Men at work in the real situations of life always have vivid ideas, for they are meeting or striving to meet the conditions that determine their business or professional survival. But not all ideas are vivid to all men. About every calling there clusters a group of vivid ideas having power to awaken all the potential energies of those to whom they are vivid because they touch upon conditions underlying their personal success in life.

But now that education has become universal. and occupations vastly diversified. the schools are attempting to supply an education that shall prepare for everything in general and nothing in particular. In doing this they have more and more displaced vivid ideas by those that are merely clear, because of their supposed universal validity. The curriculum of the secondary school must now be determined by principles derived partly from the nature of the mind, and partly from the present state of society, together with our educational equipment in secondary and higher schools. Having seen how modern higher education equips men for useful careers in every important line of human activity, the same bodies of knowledge that have made university expansion possible are in general also available for the high school. The high school may therefore offer many more studies than the student can pursue, and election upon some basis is inevitable. But upon what principle? This is the most important unsettled question before the teachers of secondary schools. The fancy, the caprice, the limited insight, even the seeming vital interest of the student, the judgment of his parent or even of his teacher, do not altogether suffice.

In our search for a principle we should be able to determine at least something from the nature of the student's mind and from that of the subject-matter itself. A normal well educated man should be intelligent upon the conquests of his race in all of the distinct fields of its endeavor. He need not understand all the languages, literature and various sciences, but he should know that they exist, comprehend something of their function. The normally constituted mind should dwell for a time at least, upon each distinctive department of important human knowledge. What are these departments? They are easily classified into groups sufficiently exact for educational purposes.

We have first of all the human sciences — those that pertain to man as man — to his life as embodied in institution. Excluding the professional aspects of such studies, this embraces languages, ancient and modern, literature, art and history.

Next we have the natural sciences — those that pertain to nature as such. They are physics, chemistry and astronomy, together with their basis of pure mathematics, the biological sciences, the earth sciences like physical geography and geology.

Finally we have the economic sciences — those that show the mind of man in intimate interaction with the forces of nature.

These sciences embrace technological knowledge, commercial knowledge with its technic and economics proper.

We have here, according to nicety of classification, from nine to twelve distinct departments of knowledge. The social reason why every student should have something of each is that each represents a distinct and important department of human *achievement*. The psychological reason why each mind should come into contact with every one of these departments, is that each represents a distinct method, a definite mental movement not found in any other branch.

Arguing now from these self-evident facts, the first I propose for the selection of a normal boy's course of study is that he take at least something from each chief department representing a peculiar method and a specific body of knowledge. The second principle is that the boy, aided by his parents and advised by his teacher, should be allowed to elect what studies he will take within each department. The first principle fixes the types the student shall have represented in his education; the second allows the individual to put the emphasis where he will, to determine what department of the university he will enter, to select his studies in view of his future career. In this way the ideas growing out of his school work become not only clear, but vivid. The student ceases to mark time or to try to escape from school. On the contrary, he works with accelerating energy and enthusiasm.

If he has equally efficient teachers, and is supplied with equally good facilities, the student in the commercial course is not inferior to his brother in the arts course, in the range of his education, in the quality of his discipline, in the dignity of his work, or the worthiness of his destination.

The range of this argument is of course broader than the limits of this topic and even of the function of the high school; but it is in agreement with the thought of President Hyde, and in addition states inherent reasons, and points the way.

I do not apprehend that high schools are about to proceed hastily to adopt courses that will forcibly turn the student body into an unjustified pursuit of commercial branches to the neglect of other essential things. But I believe that every representative high school should and will find it possible and wise to give place and recognition to this work, to the extent that will be most beneficial in its own community; and that, in so doing, not only will it provide needed education for a large constituency that will otherwise be diverted from the high school or will fail to get the education that will help it to realize the just measure of its rightful possibility for itself and society, but the benefit to the school itself will sufficiently compensate for all added expense and effort.

I am satisfied by experience that a well sustained department of commercial instruction is needed and is in its way as beneficial and as capable of accomplishing good as any other department of high school instruction, and that it justly provides for a body of students who, by reason of various limitations, are specially entitled to all the assistance the school can give them to promote their success in the competitions of life.

Inspector I. O. Crissy — While our friends are getting together the questions they may have to ask Superintendent Belknap, I should like to say to the author of this paper and to this audience that I take great pleasure in agreeing with the conclusions reached by the superintendent. It seems to me however, that the idea quoted from the address of Mr Bookmyer, to the effect that it was entirely contrary to public policy that business education should be made free in the public schools, has long since become an obsolete question. The people have decided all that long ago. They have decided that the great fountainhead for business education for rich and poor alike shall be the free public high school; that the young man without the ability to go to a business college shall have equal opportunities and just as good an education as if his father were a millionaire, who could pay without feeling whatever might be required for this instruction from private sources. And this is as it should be. Who needs this practical knowledge for business life so much as the poor boy who has nothing but his own efforts to depend on to make his way in the battle of life? Surely the question has been rightly decided. Business education is a practical thing, but it also includes technical studies that make forcefully for mental development and culture. It tends also to emphasize what perhaps we have been apt to forget in our desire to enrich, as we call it, the courses of the high school — that the best thing in education is to lead pupils to think out their own thoughts and to work out to a conclusion the ideas evolved from their own brains. That business education is becoming a recognized and accomplished fact in the State of New York, I think must be conceded. It is a matter of history — very recent history — that in the examinations given last year by the Regents of the University some of the business subjects which enter into the Regents commercial course were taken by over 400 high schools and academies, and I do not count among those subjects the academic, or elementary bookkeeping.

The business examinations consist of advanced bookkeeping, commercial arithmetic, business practice and office methods, commercial law, commercial geography, history of commerce, business writing, business English, stenography and typewriting. These are the technical subjects that are given in the full course leading to special diplomas, and the course further comprises such subjects, from the academic list, in language, in mathematics, in science and in history and social science, as are deemed most serviceable to citizenship and to business life. There are 34 schools in the State of New York of which I am advised up to the present moment that have regular commercial courses which include all the technical subjects that I have mentioned. With the exception of three schools, two of which have courses of two years and one of one year, all these schools have courses of four years' duration, and nearly all of the studies from the academic list are taken during the first two years. A completed four year course not only entitles the student to the state business diploma and the state stenographers diploma, but also wins for him the academic diploma, the graduating credential of the State, thereby proving that this course is prepared to hold and defend its place alongside of the other courses in the high schools; that it is not deficient as an educative agency or as a discipline.

Business education, however, should not be forced on the school. It should not be forced on the community. I have been asked sometimes by principals of high schools and of academies if it were not worth while to put in a commercial course. My first question before answering is, "Is there a demand for business education in your community?" "Well, no, I do not know that there is at present." "Well, then," I say, "by all means do not anticipate. Let the high school courses go on as they were. When the people want business education, they will ask for it; they will make it known that they want it, and they will make it so clear that neither the principal nor the board of education will have any hesitancy as to what they ought to do."

I believe that the fullest education possible in connection with the commercial course should be given, but it seems to me that it is impossible to get the results expected if any attempt is made to overload the course. There must be room for it and a demand for it; and I hold that it should be practical to such a degree that, when a young man has completed his four year course, he will be prepared to go into the countinghouse and there at once take his place as one who is able to continue any ordinary set of books or to fill a clerical position, and to do it without any more than the ordinary general directions that any business man would give to a new employee.

[Question by a principal] — I should like to ask Superintendent Belknap what commercial subjects he would advise taking up in a high school with from three to five teachers.

Superintendent Belknap — I do not think I am prepared to make specific recommendations. I should want to know the school itself and the community where it is located. Of course every community seems to meet this question to some degree. There is some demand in every community for such training that the young man or young woman may enter the opportunities of employment that the immediate locality affords. The business offices of course will require some knowledge of bookkeeping, good handwriting and a good command of English, at least the power of expression of ordinary ideas, a knowledge of the proper forms of business correspondence, and such of office routine as will enable a person to enter on employment under the suggestions and directions of the proprietor of the business, and to show that he has had some business ideas inculcated, so that he is in readiness to undertake his work. It seems that the day has gone by when business men are desirous of employing young men and young women who have had merely the ordinary education and who are willing to come into the office and receive certain definite instructions from day to day or from hour to hour and to follow the line of thought and of business records employed in that office, learning everything by imitation. As has already been said, business men want those who are able to take up the work and carry it out without requiring explicit directions for everything. It ought to be plain what those things are which must be taught in each community.

Principal D. C. Farr — I was surprised when I listened to that paper, that the speaker could have prepared so excellent a paper on such a subject. I think that this audience will agree very generally with me that business education pure and simple is a technical subject, and if one technical course has a right to be in our secondary schools, every other technical course has a right to be there. If the merchant has a right to demand that a commercial course be put there, then blacksmithing and every other technical subject must go there. I do not believe that it is the business of the great mass of the people to say what subjects shall be taught in our public schools; but I do believe that there is an elect body, that there are a few who by their education and by their training have fitted themselves to say what shall constitute our courses of study; and for one I believe that the time has not come, and, more than that, that it never will come, when technical courses will come into our schools and crowd out the foundation studies, i. e. such studies as are necessary to make intelligent men and at the same time constitute a proper foundation on which to base technical education.

Superintendent George Griffith — About two years ago I gave considerable time to the investigation of this subject. I think perhaps a few of the facts that I ascertained in that connection might be of interest to some here today. One of these facts is recalled by the remark of the last speaker that it is the province of an elect few rather than of the mass to dictate what shall be in the course of study of our schools. In my investigation of this subject I spent several days in Massachusetts high schools. I visited those of Somerville, Brookline, Cambridge, Boston, Worcester and Springfield. I consulted with every high school principal in the smaller cities and with the superintendents in all those cities. The high school principals and superintendents I consulted were classical graduates, most of them of the leading New England universities. In every place except Brookline I found in the high schools commercial courses that had been established from three to 10 years. Moreover, I found every superintendent and high school principal with whom I consulted, these classical graduates of the leading universities — all but one — strongly in favor of commercial courses in the high schools. That one was the principal of a high school in Worcester, and he had lately come there, and he said he was yet undecided. He wanted more time to observe its workings. Now I am one who believes, as a result of that investigation, in commercial courses in our high schools. I did not believe in them when I started out to investigate. We have one now in our high school, and experience with it confirms me in that belief. I think that my point of view three years ago is the point of view of many here today. When we think of commercial courses in our high schools, we are thinking of the old course which, five to fifteen years ago, was so common, viz, the one of at most two years in length, which was a short cut toward graduation and which was the rendezvous of the weak students who could not hold their own in the other courses. The students in it became discredited in every high school of standing and reputation. Now I am not here to stand for that kind of a course. I do not believe in it at all, but I do believe it is possible to put into our high schools commercial studies that will fit for their work this 50 ¢ or 75 ¢ of the pupils who are soon to go out into business life; to put among the electives of our high school studies those subjects that will enable the boy or the girl to get there the things which they are now compelled to get at the commercial colleges; that they may get them under better conditions; that they may get them more thoroughly; that they may get at the same time that which they do not get in the ordinary commercial college, a thorough and accurate knowledge of English and the other culture studies, the other fundamental studies in any good course. I tell you that then we will hold to longer and better courses a large number of those boys and girls that are now obliged to go out and get this other work under less advantageous conditions.

Now this does not need the establishment of a commercial college in our high schools, but it does demand the teaching of a few technical subjects, if you choose to call them such, so that, when the boy or the girl graduates from a four year course, he or she is ready for something.

One other point was touched on by the paper, and that is the point that is considered in the discussion of this subject so common throughout our country. That question is whether we must have special high schools in the commercial subjects — special commercial high schools — or whether we shall put them into our general high schools. For one, I want to express a most positive conviction that we should not have such special high schools, even in our larger cities, which are able to have them. I do not want a commercial high school, I do not want a manual training high school. I want a high school, or high schools in the different parts of the city,. where the education will not be one-sided, but will be general in its fundamental requirements, and at the same time give a certain training for the special work that the young person will have in life. I think if we put in a few commercial studies, it is not going to add much to the curriculum of our schools. It may require a more extended study of certain subjects like geography or history. It may require an extended study of those subjects in the general course; but thereby do we not meet one of the requirements of thoroughness that was so ably set forth last night by the speaker, viz continuity, or longer study of the same subject ? So I say, let us add these to our high school work where there is a demand for them, and where there are facilities for carrying them on thoroughly. Let us make them a part of the electives which may be put into a full course; but do not let us offer any short cut to an easy diploma, so that this course shall be the rendezvous of weak students.

Principal E. F. McKinley — One great difficulty of introducing a commercial course in the smaller high schools comes from the thought that we must put in a large and expensive one. For this reason we stop short of introducing the course at all. I come from a town where we have five or six teachers in our high school department, and there is a demand in that community now for some business training, and we expect to put it in in another year. We can not have 10 or 12 different subjects, but we hope to introduce one or two that will prepare the pupils to some extent for business when they graduate. To express it in detail, we expect to have bookkeeping, stenography and typewriting. Some of you may differ with me, but our community demands these, and we expect to comply with the demand. About 75% of the boys in our high schools enter business. That being the case, the people in almost every community demand that we furnish some business training. One member of our board of education said: "I have in my bank a graduate from the high school. He has had a good course; and yet I would not feel like continuing that boy in the position of stenographer for a longer period than one month, because he can not spell." He said: "There is some vital defect in educating the boys in our high schools for a business career." He made particular mention of the subject of English, and said that we neglect the subject, specially along the line of commercial branches, leaving out too many of the essentials for the advancement of the pupils when they get out into business. It seems to me that, if we introduce only a limited amount of commercial subjects in the high school, specially the smaller one, we shall get at the keynote of business education.

President C. C. Gaines — A question was asked a few moments ago which, because of my experience with a business school, I shall take the liberty of answering. I refer to the question of that principal who wished to know how a high school, having a faculty of four or five teachers, might best answer the demand among its patrons for some definite training for business. I conceive this question to be of primary importance, for the simple reason that it is said with truth that about 75% of the pupils in our high schools expect to begin life as employees in some sort of business establishment. But these are not all the young people who are destined to the same general line of activity. I am told in New York that only about 5% of the children, in the schools of the city enter the high schools. What becomes of the other 95% of the grammar school pupils ? A large majority of them fall short of finishing even such a course as is given in the city grammar schools, where, as you know, pupils are graduated when they complete the course of study given in eight grammar grades.

I am witness to the fact that the course they get in these grammar schools is, as far as it goes, a good one; and, as it is all that the great majority of our public school children can get, I think they ought to receive a diploma or some evidence of graduation of similar dignity. But out of the not less than 400,000 children in attendance on the grammar schools, how many graduate in the course of a year and are thus candidates for the high schools? Perhaps from 15,000 to 20,000 pupils. Some say that the number is not in excess of 8000 or 10,000. How many of these go through the high schools? Not a great many. Probably less than half. What becomes of all the other children, numbering hundreds of thousands, who begin their education in the grammar schools?

Why at some period in the eight years of the attendance on these schools the education of much the larger proportion of these children is interrupted, and they go out to make a living at anything whereby they may earn a few dollars. The physical necessities of their homes require it. Thus the ultimate result is that of our enormous annual enrolment more than 95% go out into life with such preparation as we are able to give them in the district schools, in the grammar, union, and high schools, small and great, in the villages, towns and cities of the country. They do not get all they need, certainly they do not get all you would like to give them. They must take what you, as principals of your various schools, are able to give them. With this they go out into life either to follow some trade, or to begin in the home, on the farm, in the factory, or in a business or professional man's office as office boy, or as an assistant in any work they are enabled to do by the sum total of the educational training so far received.

Now the question, what may the grammar, district or high school, which has from four to five academic teachers, best give which will most thoroughly prepare these young people for the work in which they are to engage is, I think, in the light of these statistics, exceedingly important. There is none more so, if what I have stated is true, and I think it is. My experience, during many years, has been with the commercial school pure and simple, a school which has received the students of the grammar and district schools, of academies, high schools and colleges of the country, at every stage of progress, and undertaken to fit them for business. This experience has enabled me to know, as you probably do not know, both what these students need and what the business men want in the way of qualifications. It has been my aim to meet the demands of both, to produce the results, to give the qualifications sought in the young people who are taken by the business men as their helpers for various functions.

What then, my friends, does this experience teach to be the best commercial education you can give your pupils? Permit me to say that I am pointed to the same conclusion whether your pupils are to leave you after completing such a course as you can give them in the district or grammar school, or after having added what you may give them in a high school or college. It does not make any difference which one of these types of school you conduct. It does not make any difference whether you have a faculty consisting of one teacher or of five teachers or of 50. The elementary things of greatest importance are so simple that they are possible to any school worthy the name, no matter how small its equipment. Any business man will tell you, if you ask him what qualificatons he wants in a beginner in his office, that three things are of first importance: that the boy or girl must write a plain and rapid hand, must be quick and accurate at figures, and must be able to use properly the English language.

All essential as they are, how few of the pupils of any school, no matter what its grade or type, possess these simple accomplishments! I grant you that they may not be all that is expedient. I have not mentioned either bookkeeping or stenography, the bread and butter sciences which are said to constitute the backbone of the business school curriculum. They are both eminently useful. They are not necessary. There is no question about this as to bookkeeping. Yet I do not propose to underestimate the great value of a knowledge of accounts. I would consider its value higher than that of many of the branches which displace bookkeeping in all our schools, but the law of diminishing returns is beginning to apply in a very large degree to the bookkeeping department, specially of the commercial schools in large cities. It will never lose its place altogether, but as a more advanced or finishing study, it is certainly of less importance today than stenography. Yet neither of these is anything like so valuable as the elementary accomplishments I first mentioned, and those are all within your reach.

From my earliest experience down to the present day, the two things that business men have invariably asked of me in boys and girls whom they sought to employ were the ability to add correctly, and to write a good hand. These, at least, are the primary or absolutely essential qualifications for business. Does the boy know his ARITHMETIC? I do not think I have heard this word pronounced in the present discussion. Arithmetic is the branch to which your labors should be more extensively devoted than they are at the present time. I say this because I have been in the habit of receiving pupils out of your district and grammar schools, and out of your high schools during 20 years, and for some reason practically all of these young people fall short of anything save the most superficial knowledge of arithmetic. I do not mean to criticize, surely not to find fault. It is a condition and not a theory that confronts us all. The thing to be done is just as much on you as on me, for it is only the smallest percentage of your pupils who will have the advantage of definite business training in any type of school. Yet they are going into life nine times out of ten not knowing fractions, one hundred times out of one hundred not knowing how to add. The fewest number of them write for business purposes passable hands, while the percentage of those who spell correctly or who may be said to be in any sense thoroughly proficient in the use of the English language is certainly smaller than it ought to be.

I think this is the key to your situation. To accomplish what I propose, you do not need to enlarge your equipment, to increase your teaching force. The means at your disposal might make additional expense in these directions impossible, and this is one of the most serious problems which all our high schools must face, in the matter you have in hand this morning. If you introduce bookkeeping, stenography and typewriting, you will almost surely have to add an extra teacher. It is more than probable that no member of your present working force can teach effectively these branches. It requires some special training to teach writing well. I mean that the teacher shall have some skill in penmanship. I note that some of you smile when you hear that last word: but let me tell you I have every year an increasing respect for good writing, growing out of the fact that there is everywhere a demand not only for plain, rapid, commercial writing, but because I know from experience that the man who would teach pupils to write that hand must himself have been taught to write properly. Very few of the children are taught to write properly in our public schools and academies. So, my friends, I hope you will pardon me for say ing that I believe in these two things, that you should give your pupils a thorough knowledge of arithmetic and a good handwriting.

The third thing I would like to see you give them is a better knowledge of the English language. I know that this is one of your bugaboos, for it is one of my own. To have our pupils taught to spell correctly, to capitalize, punctuate, and paragraph properly, to express themselves with clearness and precision — effectively — is my daily conflict. I do not wish merely to teach the forms of commercial correspondence. These are in a sense wooden and very simple. A business man can stand a want of proficiency from this point of view. The defect is not so marked; but he does not want to sign and issue any sort of letter or document with a word in it which he knows to be misspelled. We all have more than our share of trouble on account of spelling. I do not mean by this reference to the matter to remind you of a fault that is peculiarly yours. I simply desire to stimulate greater interest in the effort to enable children to gain this difficult accomplishment.

And just here you will pardon me if I talk a little shop. I know of nothing which so improves a pupil in the knowledge and use of the language as the six months study required for learning stenography; in fact, the acquisition of both stenography and typewriting involves nothing short of the study of words and the correct use of them from beginning to end; and I know of no ancient or modern language, nor, in fact, of anything else, which goes so far to assimilate propriety in written expression.

Let me resume. Just keep these things in mind, if you can: send your pupils into life writing good hands, having facility and correctness in arithmetical calculations, and knowing the English language — its spelling, punctuation and composition, with such a degree of effectiveness in expression as it may be possible for you to produce in them, and you have done by them what I believe to be most needed in the way of giving them education for commercial or industrial pursuits. The real fault is, I believe, not with the teachers. It is in this, that in attempting breadth, in attempting to spread your courses of study over this thing and that thing, you are forgetting that one principal aim of education whether it ends in the grammar school or the high school, should be to give the pupil proficiency at something. I do not care at what age, or from what grade of school, the pupil may begin active life, whether it be from the primary school or the university, whether the scholar "graduates" or "quituates," the course taken ought as far as possible to have made that pupil proficient in what he has gone over; at least to have enabled him to do well the three things mentioned. I hold, therefore, that no pupil of the grammar school is ready for the high school till he is proficient in these elementary studies; nor is any pupil of the high school, who has them not, ready for college; nor is any graduate of college or university, who has them not, ready either for making a living or for life.

Principal J. L. Lusk — I would like to ask a question. Assume that we teachers train boys or girls to add columns of figures accurately, and they afterward take up other subjects. How long will it be before they will forget the combinations necessary to rapid addition? Will the impression made on them be such that they can do their work with confidence at the end of three or four years?

President Gaines — Of course this accomplishment is susceptible of being lost to a degree through lack of practice. Anything involving skill is a comparatively transient power. Had any one of us a speed in shorthand sufficient to report this meeting, it would be gone to a degree in six months or a year, if he were to fail to use it. But it would not be gone altogether. As to figures, I have had the power of rapidity and accuracy at them repeatedly, and have afterward lost it in a way for want of use; but, whenever I have needed it, I have regained it again and again very readily to the degree of skill required for practical purposes. As to the degree of confidence one may have in work of this kind, let me suggest that pupils should be taught to prove the correctness of every addition made, and to make it a habit to prove as they go.

Principal J. L. Lusk — I simply want to make this point. We as teachers might do our work ever so well, and then our pupils might go into your school, and not do us justice, and you would blame us.

President Gaines — Pardon me, I do not mean to blame you. I also am a teacher and know very well what it is to handle the kind of material with which you work. My own work is fully as susceptible of criticism as yours. I do not always get uniform or adequate results, no matter how hard I try. I will tell you where I think the fault is with your pupils to a degree. It is in the system — in the stage of your work at which your pupils are permitted to discontinue the study or use of arithmetic. We have, in this state, the fashion of giving a pupil a preliminary certificate, based on passing examinations in the elementary subjects. This certificate is given to many pupils at the age of from 10 to 14 years, on a comparatively superficial acquaintance with some of the studies to which it relates. The child is after this permitted to drop arithmetic, and little attention is paid to the study in the high school, and none at college. Thus it is a fact that a large majority of students enter the university unable to add figures with any readiness.

Now I am obliged to say that I do not consider either algebra or geometry of very much importance ir the practical affairs of life, or that (except to the engineer) any part of the higher mathematics has half as much value as plain, old-fashioned "Rethmetic," with its *big fore* fundamental rules; for at least 95% of all young people will need them a thousand times to their need of algebra once. So I say we are giving this subject too little attention. We are allowing the children to drop it too soon. It is a defect in our system.

Principal L. W. Hoffman — It seems to me that, in proposing business courses in our high schools, we are prone to make the mistake of taking a wrong position. These discussions seem always to take the point of view of supply and demand, and men tell us that we must have our pupils do thus and so because only by so doing may we satisfy a certain demand. I do not take that view of young manhood. I do not believe that the schools are intended to make machines to satisfy a demand. We know what the average business man wants, and we do not need any business college experience to tell us. The average business man wants a boy to be a machine, accurate as a machine, working as beautifully and submissively as a machine, achieving results as satisfactorily as a machine. We are not in the business of making machinery.

We have refused to adopt that conception of the work of the school.

Now this discussion has seemed to me to fit very well the interests of the city high school and of the school which has as many as five teachers to do its work. I do not wish t[illegible] registered as against business courses as such in any school. I believe in them; but I want to call the attention of this body, representing as it does in its majority, not the principals of the city high schools which can afford as many as five teachers, but those of the rural high schools that are running with two or three teachers or at best four; and I say that we have come up against a proposition here that is going to trouble us for some time. We have on the one hand, the necessity of preparing students for college. We have, on the other hand, the great duty of preparing them for life. We have to decide which is to be our chief business. Is it to be to prepare them for life or to get them ready for college? With the present conception of what is proper in a college entrance course and with any proper conception of what is an adequate preparation for life in the world with all its modern inclusions, we can not do both. Yet we are attempting to do both; we are being forced into doing both, and, in this attempt and under this compulsion, we are spreading out our course so thinly that it does not cover anything. I put the problem to this house; and, if anybody can offer any solution or suggest any course that will lead us out of the difficulty into which we have come, I for one shall be duly grateful.

President George H. Ball — I will not attempt to answer the question before us. I am a little worried over the distinction made between an ordinarily educated person and one educated for commercial purposes. My thought is that we all, both students and instructors, properly belong to the commercial side of life. We surely need instruction which will fit us to do business correctly and accurately, and specially to keep accurate accounts. There is not a farmer, mechanic, homekeeper, parent or child but needs to be instructed in orderly, systematic keeping of accounts. This involves of necessity ability to write plainly, and apply arithmetic and the elementary principles of bookkeeping. I venture to assert there is no class of men in the country who need instruction on these lines more than farmers and housekeepers. They certainly should know how to keep accounts, and that practically involves a good beginning of the whole matter of commercial education. It appears to me that this work of fitting persons for commercial life is simply fitting them for all kinds of life. They want to know how to write, how to spell, how to set down and add columns of figures, and this is about all that is required at the start in our great commercial establishments. Do we not often overlook these essentials while considering education for more advanced work in commercial life, such as managing banks, transportation, shipping and all that? We certainly need an elementary commercial course in every grammar school and in every high school. It is greatly to be regretted that so many come up from the grammar schools to our high schools and even to our colleges, who do not know how to write, how to read, how to spell, how to add figures or to put them down to be added, accurately and in systematic order.

President Fosdick — No more important subject can be brought before any body than that which pertains to our own language. We may have a momentary enthusiasm for French or Spanish or even Italian or Portuguese; but he who would accomplish anything worthy of the name must have a good knowledge of his own tongue. So I am very glad that we have with us this morning an exponent of good English, and I am glad to introduce to you President Stryker of Hamilton College, who will talk to us on preparation in English.

THE DIFFERENT AND INDIFFERENT DEGREES OF PREPARATION FOR COLLEGE THAT APPEAR IN ENGLISH, SPECIALLY IN COMPOSITION, SPELLING, AND PLAIN, OLD-FASHIONED READING ALOUD

President W. M. Stryker — There is a great difference between an exponent and an expositor. There is nothing that the preacher who has little to say likes better than a long text. First of all, I believe it is a rule of Quintilian that one, if possible, should put himself on good terms with his audience; and so I wish to say that I came to get rather than to give, and I shall not be disappointed even if you are. I suppose that, when we have compounded all the materia medica of this great intellectual pharmacy, the total result, when it is well mixed, would be good for each one of us to take about once in so often. The minor things in which we divide are numerous; the things in which we absolutely agree are few: but the things in which we divide are an almost infinitesimal percentage in their ratio to those in which we agree. Ordinarily in any such body as this emphasis and stress are laid more on the things in which we differ. We raise our questions and we hear less of our broad, substantial, foundational agreements. You all know how composite pictures are made. If you do not know the process, you know the result — showing firm features for the central part of the face, and the hair and all outer lines shading off into the vague. A composite of the ideas of this company would be clear and distinct in those outlines which make an expressive countenance. It matters not so much whether a man's hair be long or short or much or little, so he have good eyes and a firm mouth, and so his soul sits in his face. The composite picture of this company, representing not only what is here but so much that is behind it and related to it, has a face of immense earnestness and imagination. How can we but be glad to gather in such a noble place as this, and to see that at last education and its appurtenances, its apparatus and its appliances, are coming to claim and to get the very best that our imperial State can give them. I believe that most of us are prompted to an architectural lust for something as good. I never see two bricks near each other without thinking what kind of building I could build them into; and to gather here should give every one of us a new inspiration and aspiration, finding what the principal of this school with his associates has been able to do in arousing and fixing fast the intellectual public spirit of this central city.

I am not here assuming that I know more about my text than you know. I have always found the most pleasure in preaching to those who knew their Bibles best; they could "piece out my imperfections with their thoughts." And I am far from desiring to stand in a dictatorial or a dogmatic attitude, specially before such a company. I do not wish to emphasize the things in which any of us are apart, but to plant myself as squarely as I can on those substratal things in which we all unite and agree. I have been greatly edified from time to time in attending gatherings of a liberally named association of the Middle States and Maryland (including Maryland) and I have always been, or at least had the opportunity to be, immensely instructed as I have listened to the heads of divers universities occupying themselves ordinarily in giving information as to how to steer a college — a matter in which I do not sit at their feet. I should no more think of taking everything without salt that one has to say of the college from a university point of view, than I should think of asking him to open his mouth, shut his eyes, and take my views of the university from a college point of view; and I should consider myself equally impertinent if I should assume from the mere college point of view to tell a group like this how I thought a high school should be managed. I have sorrows of my own without borrowing.

There is so much to be said. "O Lord," the fisherman prayed, "the sea is so large and my boat is so little!"

If any one has imagined that I would assume to go into the details of this subject so as to show how English should be taught, he is wasting his time in listening to me. Always I believe that to grasp great principles and get hold of agreements, to see things broadly and largely, to understand the goal toward which we run, is far more than analysis of detail. I do not care how you go if you get there; but, if you do not know where you are going, you never will arrive. It was Cromwell who said, "No man ever goes so far as when he does not know where he is going." I shall put all the pressure that my time permits on agreement with the substance of what has been already said this morning — that we are to equip men large for life. I have no carefully subdivided heads. I wish to jump again and again on that particular point, strike again and again — I would it were a beetle and not a tackhammer — on the proposition that all our schools are first to begin men well and second to carry them on well as men — and by men I mean women also. There was a Scotch preacher who longed for a word of appreciation, who said to a woman in his congregation, "What did you think of the sermon?" "Well," she said, "first ye read it, and second ye read it ill, and third it was no worth the reading." If we do not teach our boys and girls to think, give them outlook, hope, ambition, mental lust for all that life can acquire (I use that word advisedly and ethically), I do not care what primary or what secondary subjects you tack upon them, you have after all but the least inkling of the end toward which you have wrought.

First of all I object to the distinction implied here between preparing a boy or girl for college and preparing him or her for life. If our schools do not prepare those who enter them for life, they are simply anachronism and blunder. If our high schools and our grade schools and our primary schools do not prepare the boys and girls for life as they grow, they are of no use. I have no desire to make impossible technical, special or personal demands on the curriculum operating in this or in that school. We have a large menu offered us of this theory and of that, and we take what we can eat, and more would be but ill digested. I object to the proposition that any schools below the mature technical school, the schools that take hold of youth from 20 on, are to be interpreted in the light of the great modern pedagogic heresy, that from the time a child cuts his milk teeth till he is 25 he shall specialize. I do not see how the high school as such — I do not say it is not true, I am open to conviction — but, with what light I have now, I do not see how it can afford to go into the technicalities of this or that commercial life. I do not see how it can afford to take precious time, that the boy or girl should then and there be giving to wider subjects, for a limited preparation which after all shall stand him in no better when he comes to the specific thing. How can time be stolen from these breadths to give, for instance, to the acquirement of typewriting or piano playing or any other merely technical branch of mental artisanship or art? I do not see how it can be done. Surely nine out of every ten of us agree with the substance of what was last said: that the great thing in education is that every boy and girl at 15 or at 30 (for I find that there are some girls who are 30) should know how to do the things well that must be taken for granted. I never got much further in arithmetic, that is, arithmetic never got much further in me, than the four fundamentals. I could not now extract the square root to save my life. I have had no use for it since I had to recite it in 1863. But I am glad that I once knew that there is such a thing; and I would know where to go to find out about it, and to learn to extract it and perhaps the cube root too in an hour. But, as for the things that I have use for, as, for example, addition — forget it? — how can I? Why, of course, "if I do not play for a day, I know it, and, if not for two days, the public knows it" and all that. But, after all, how can a man forget to add? Can you swim? Have you been in the ocean or the river for 15 years? Perhaps not; but, if you were turned upside down in the river, you would strike out and swim, and you could not help doing it. Have you skated for five years, or 15, or 20? If you were to put on skates, you might not cut all the figures you used to, and would probably cut some that you never did before, but you could skate. How could you forget to stand on your feet in skates? Of course we have to learn to add, and so that it is second nature, and to learn to write. If I had one coming to me with a recommendation or for one, I should be better able to judge him by a three page letter than by any other single thing. Positively, I do not think it is decent to write a slovenly letter; and, though I know nothing of the art of deciphering character from handwriting, I have seen it done in such a way that I am convinced that there are laws, not very occult, of self-revelation in chirography. Of course, one should learn to write, whatever he has to do afterward, a good, clean hand. And he should learn to spell. But the danger is that some will be swept off their feet in this last day of ours, in which it must be specialty A, and specialty B, and so down, that they will forget the plain, old-fashioned things which are the fundamentals of the educated life. I do not believe there is a way of learning to spell easily. The kindergarten idea is a mistake in so far as it claims that, in order to get one to do a thing, it must be made easy; it is not a manly idea. I prefer to chew my own food. I do not believe that the lad or the lass is to be coaxed or candied or cookied into doing what has to be done.

The good, old-fashioned way of doing it, like it or not, is the method that makes men and women. At eight I began my first Latin declension in my old Bullion's grammar. I learned every rule clear down to no. 76 and backward before I had ever translated one sentence of Latin. Now that is all folly, of course; but my Latin grammar was drilled into me when I was under 10 in such a way that it never got out. I just had to learn it by sheer grit, and that is the way to learn to spell. Only a fool thinks he is invulnerable in anything; but I should feel just as mortified as if it were wicked if I should misspell a word in a friendly letter, and any man or woman who persistently misspells should be ashamed and begin over. There are some things which it is not a virtue to have but which it is a vice to lack, and spelling is one of them. It is like keeping clean. Cleanliness is no virtue, but it is horrid to lack cleanliness. In the schools we must teach to cipher, to spell, to write, and to make short English sentences if we do not teach anything else. We must assure the fundamentals. Give me a boy who writes a beautiful hand, and I am sure he will spell well; and give me a boy who can write a good clean hand and can spell, and I am sure he can compose well; and, if he has those, I am also sure he can read well, and will have been taught to do so.

English is the hardest thing to secure mainly because it is considered to be the easiest. It is a hard language, and one does not get it from his grammar. I learned to speak English by being with folks. My teachers, men and women, good ones, were fathers and mothers to me and corrected me, and I gave them reverence. The way English is spoken well is by imitation. Some teachers think, if it can be called thinking, that a child will somehow get English by being in the same room with it — I mean English literature. How many of you feel that, when you have a mind put into your hands, it is like the rough diamond which you are to study as the adept in gems studies that stone to see what can be made of it; shall it be flat or deep, what shall be its facets and contour? It is his particular diamond, and he puts all his skill on it: and so the purpose of teaching is to make the most out of that particular boy. You can not teach English letters if you do not love them. You can not touch on the phases of its literature, if you do not deeply read it.

But English literature is aside from my subject. There are different and indifferent ways of teaching to spell. There is no easy way, and the sooner you begin the hard way the better. As to composition, begin just as soon as you can, and stick at it just as long as you can. I am in my teens yet in the matter of English composition. Is there here the woman or the man who does not correct himself every time he writes a letter? Why choose this word and not that? What shall be the salutation and the ending? If you do not regard the niceties of vocabulary and love words for what you can do with them, not to make a fair show in the mouthing, but because they are strong and hard and alive — if you do not love these things, how can you teach a child to write forcibly?

But I think that composition is better taught in the schools and that spelling is better taught in the schools than reading is. Once, in the presence of President Patton of Princeton, I made a little plea which I am prepared to make anywhere, for at least a thorough introduction in the college course to the historic and literary and some other features of the English Bible, and he said that it "is a good idea, but where are you going to get it in?" Well, I should say, if you can not get that in, leave some other things out. It is a shame to be unfamiliar with the good word of the living God and the tongue our mothers taught us, not to know where the book came from and how we have it as it is and what it is worth even as literature; and I will never let the opportunity go that I have now of putting in as my primary plea for Greek, that the most important book ever written in the world was written in that tongue. It is because we are so busy that the 'ics and the ologies crowd us. We have so many recondite questions to answer. I do not care so much how many "counts" a boy has as how he got them. I would rather he had less of quantity and more of quality. Would any teacher here desire to be asked offhand to read half a page of Macaulay or of the *Idylls of the King* or of the *Constitution of the United States?* I do not say get through it; I am not talking about orthoepy, but to read it so every listener will be interested? The class of readers that I hear most are preachers. I suppose that in the long run I hear the Bible read aloud more than I hear any one English book, and I hear it abominably read in many quarters. I know some men who are great preachers but who are not able so to read the Bible that a congregation will be glad and will get new ideas as it listens. I have never taken 50 freshmen and stood them in line to examine them 10 minutes apiece in reading, but I do not believe (and am sure we are no worse off than others) that more than five out of 50 are good readers. It is not taught in the schools as it used to be. When I was a little shaver, my father, sick for a long winter, had nothing better to do than to teach me to read as he lay on his back. I was four years old. He said, "You do not make that mean anything." I had to read in school and for him for the next eight years of my life. I had rather know how to read English well than to have any other accomplishment. I do claim that, simply as a plain, respectable citizen, not an ignoramus, I can take any legible page of English and read it decently. Our boys and girls ought to learn how to do that. It is a disgrace to a boy not to write a decent hand, not to spell correctly, not to learn to express himself well in simple language, and not to read interpretatively so that the meaning flashes as it sounds. These are the fundamentals of education. The boy who goes up to college prepared in Greek but who can not read well, prepared in mathematics but who can not spell, prepared in Latin but unable to write a decent hand, is ill prepared for college or for what lies beyond. After all, the best preparation for college or for life is to broaden the horizon, to get large views, to make brave and fearless and sure of oneself, mentally ingenious, quick to act. At the base of the whole superstructure is the discipline to do well those things which come first, and the first things are those which pertain to the everywhere and the always. We must not displace the indispensable by the secondary.

Principal W. B. Chriswell — I believe that President Stryker is right when he says that all education should prepare for life. What he has said about reading and spelling I believe is right and important. But, when he says that preparation in the high schools should be the same for college as for life, I think that there, in a way, he is mistaken. As you would build a foundation for this building differently from the foundation for a smaller high school in the country, so you should have a different foundation for a college education. You must build so that the building can be completed. If you should make a small foundation, you could not put this structure on it; so, if you should build this foundation and undertake to place a small high school on it, it would fall in and disappear. So there are certain subjects that should be taught to those who can go on into college and complete their education there. If a boy is going on, we know that he will complete his education there; that he will take subjects that he might neglect in the high school. But certain subjects should be given in the high school to those who can not go on and take them in college. So I believe that there are certain subjects that should be taught in the grades to pupils who will complete their education in the grades. There are so many who never have an opportunity to take high school subjects. They can understand the same subjects to a certain extent — not to the extent that they could in the high school or college, but they should have a certain amount of certain subjects. For instance, I believe that in most schools the subject of history is neglected in the grades. In many schools nothing whatever is given of history in the grades. So I say they should have this subject, as they should have other subjects, to prepare them for life, because they can not go on and get them in the higher schools.

I believe that, when the speaker says things should not be made too easy, he has spoken the truth regarding some, but he must remember that some children must have things made easy for them or they would never accomplish anything.

Inspector E. W. Lyttle — If Principal Hodge of Malone is in the room, I wish he would tell us what he does when pupils come to him for examination in reading.

Principal L. F. Hodge — Our method of giving the Regents examination for admission to the high school is this. We divide our examination into two parts and mark equally, according to what the pupil does in each of these two parts of the examination. When a pupil appears for the examination, we first present to him an article taken from some current magazine. We allow him to read this article carefully once, and then he is required to give a reproduction of what he has read. Half the credits are allowed on this test. Then we present another selection to the pupil and have him stand up before the examiners and read aloud. We mark on this according to four different things: the position which the pupil takes, his interpretation of the matter, his pronunciation and his enunciation. We allow the other half of the credits on these four divisions. We examine candidates in reading before two, at least, and if possible three examiners, and the average of these examiners is taken in estimating the final mark of the pupil. It may seem a little strange, but it is true that several times we have had to refuse to pass candidates. If they fail, they have to take the reading examination at some subsequent examination in order to receive the counts. We have found this method very satisfactory. We believe that it helps to increase the interest of the pupils in the subject and causes them to take more care in preparing for the examination.

Question — Is the first part of the examination oral or written?

Principal Hodge — Oral.

Question — What do you do with the German boy or the Polish Jew?

Principal Hodge — We make an allowance for them. We are right on the Canadian border and have a large French population, and in a case of that kind we think it wise and just to make certain allowances.

Question — Who are the examiners?

Principal Hodge — The examiners are teachers in the high school.

Question — Would you require them to read poetry as well as prose?

Principal Hodge — We have always confined ourselves to prose.

President B. W. Hutchinson — I was very much interested in the address of President Stryker. He said a great many valuable things and very little that I should want to criticize. I have been working now in the State of New York for nearly five years; and I think it might interest some of the principals and teachers present to learn something from the experience that I have had with English and spelling. I have taught in three other states, and this is the sum of my experience: I have found the English weaker in New York State than any other department. The students that come to our seminary, many of whom are high school graduates, are weaker in English than in any other subject. There has been an improvement in the last three or four years, however, in this respect. They are very weak also in spelling. Now I account for this — possibly I am mistaken in this theory, for I have great respect for the Regents system and for the Regents standards and ideals — but I account for it in part by the fact that pupils get 75% in the Regents examination and then drop the study. In English, they pass a not very rigid examination in elementary English and are allowed to go on with the high school course. I was impressed with this particularly as I came to this State from a state that is far behind New York in almost all the important elements of education, a state whose public school system is by no means developed to the degree of perfection that New York can justly boast of, yet I find that the students who come to our school in New York State are not as well up in English as those that come from the inferior schools of other states. It seems to me that we ought to do more thorough work and insist on a higher standard for admission to the high school in these studies, specially in spelling and elementary English.

As for old-fashioned reading, I am heartily in sympathy with President Stryker's remarks regarding this. I was brought up under the old method he speaks of and I believe in it.

Inspector C. F. Wheelock — Perhaps this is the proper time to mention the fact that there have been repeated requests made by principals for an examination in advanced spelling, and that one academic count be given for passing it. We should be glad to have an expression of opinion regarding the matter. If I may be allowed to make a suggestion, it would be that no count be allowed for such an examination, but, if anything be done, that it be made a condition of obtaining the academic diploma. If the principals generally desire such an arrangement, I believe it could be brought about.

Principal F. D. Boynton — I move that we request the Regents to give an examination in advanced spelling during the fourth year, without counts, and that the passing of this examination be made a necessary condition to securing the academic diploma.

Principal D. C. Farr — I only want to say one word. It seems to me but just that a protest be put in at this point, not because we want to lower the standard of scholarship in this State, but because all of us who have been teachers for some years know that there are some pupils who never can graduate from an academy in this State if this is insisted on. It means more for some students to get 75% than it does for others to get 250%.

[*Moved* as an amendment that the time of the examination be not confined to the fourth year.]

Principal John Holley Clark — I am a great believer in the importance of correct spelling, but I question the wisdom of this measure. It seems to me that we ought not to adopt this resolution without very careful consideration. There are some students who are deficient in spelling, try as they will; they will only be indifferent spellers, and yet they turn out well in many other directions.

I was very sorry many years ago when the Regents reduced the number of words required for passing in spelling from 85 to 75. It struck me as a step backward, and I think that a great many of the evils that are complained of are due to that action of the Regents. Eighty-five was formerly the minimum and 85 was low enough; and yet I knew a young man, who subsequently became a very successful teacher, who passed all his other preliminary subjects two years before he could pass in spelling because he was required to get 85% in this subject. And yet I believe that those two years that he spent in getting 85% in spelling were perhaps the most profitable years that he ever spent.

It strikes me that the way to right this matter is to right it at the root. Pupils do not study spelling very much in the high school except incidentally. They ought perhaps to study it more than they do, but it strikes me that, rather than to introduce a new examination in advanced spelling which should be a condition of getting a Regents diploma, it would be far better to go back to the old plan and require 85 words to be spelled correctly in order to get a preliminary certificate.

Superintendent Emmet Belknap — When this suggestion was made by Inspector Wheelock, it seemed to me an exceedingly good one; but the point immediately rose in my mind as to whether such examination should be deferred to the fourth year in the high school course and be made an essential on which the matter of graduation should depend. I can sympathize with the point raised by Principal Farr and the fundamental fact on which his suggestion lies; but it seems to me that one of the very things to be desired and in fact accomplished by such a course, if the resolution be adopted, is to secure attention to this important subject in those years subsequent to the grammar grades — where the subject of spelling is a subject of permanent or systematic instruction — after which it disappears from view, because the pupil is supposed to have passed an examination. It does seem to me that some plan may be devised whereby spelling may be considered as an important matter for regular and systematic instruction even in the high school without at the same time bringing to issue the point raised by Principal Farr; if, for instance, it could come in connection with the standard for first or second year English. I have no idea that the Regents would be disposed in an advanced spelling examination to make a condition which it would be impossible for any student in Principal Farr's or any other school to meet who could pass in algebra or Caesar or the English of the course.

Principal Howard Conant — It seems to me that this resolution is too radical a change to be passed on thoughtlessly here. When we get back to our schools and consider the conditions that prevail there, we shall find that there will be some students who will never be able to meet this condition. Spelling can be carried on every day in our high schools if the English teachers will do their proper work. There is no question that spelling correlates with all other subjects, and there is no need, it seems to me, for a special examination of this kind. Some scholars are deaf to certain sounds, and this physical defect prevents them from distinguishing the nearly coincident sounds of some of the letters of the English language, and they can not properly spell words as they are pronounced. I believe that this resolution should not be passed, and I move that this matter be laid on the table for one year.

[Motion to lay on table carried.]

Tuesday afternoon, December 30

MANUAL TRAINING IN VILLAGES AND SMALL CITIES. (1) TO WHAT EXTENT IS IT PRACTICABLE? (2) TO WHAT EXTENT SHOULD IT BE CARRIED?

BY PRINCIPAL VINTON S. PAESSLER, BARLOW SCHOOL OF INDUSTRIAL ARTS, BINGHAMTON

The measure of a life is its influence on the world for good, or for evil. Man is not taller than his highest ideals, and not broader than his humanity. "Life's greatest accomplishment is to appreciate life." A hand to hand conflict for mere existence is not living. The serious purposes of life are not subserved by the low and vulgar appreciation of ignorance. The don't-know-how-to-work, don't-want-to-work, always-out-of-a-job loafer is a social and moral leper, a menace to mankind, and a curse to himself. Character, the fountainhead of action, is destiny, individual, or national. The only salvation known, to the individual, or nation, is along the line of thoughtful action. Our national progress indicates this. Uncounted thousands of miles of railroads, with all of their wealth and advantage, have come to us in the last 70 years. Within our own memory, the telegraph, telephone and ocean cable have robbed time and space of much of their terror. Without the service of electric power, light, and heat we would be crippled. Rapid growth and development are everywhere in evidence. Thirty years ago the laboratory method in education was practically unknown. Now the laboratory buildings, in higher education, outnumber the academic buildings. Today manual training, as a laboratory method, is hand in glove with the secondary work in physics and chemistry. It is the laboratory method *par excellence* in the grades. Manual training, carefully correlated with the work of our public schools, helps to clarify and establish many of the intellectual processes. Beyond this it assists in the teaching of that culture and refinement which touches character with an unconscious and inexpressible charm, a beauty like that of some delicate flower, but which adds to life's joys the strength of the giant oak. The time has never been when good men did not aspire to be strong and capable. A clear, perceiving eye, a swift foot, a lithe body, a strong arm and a skilful hand have a beauty and fascination beyond mere utility, they are the external evidences of a sound mind in a sound body. Where this motor organ fails, the mind becomes weak.

Pedagogy teaches that education has as large a contract physically as psychically, else psychology has not well established its senso-motor parallel in its attempt to make plain the physical and psychic coordination and reciprocity. A great engineer in the cab of a toy engine is just as impotent as a rag doll in the cab of a hundred ton transcontinental flyer. The great engine is just as necessary to the engineer as the engineer to his engine. Montaigne says, "We have not to train up a soul, nor yet a body, but a man; and we can not divide him." In a general sense, education is responsible for the successful conduct of life. But what do we find? The wheels of progress have not lightened the burdens of grinding poverty. The fleet-footed-easy-runner has set the heavy-slow-foot a sorry pace in the race for this world's rewards. And this is just what the conservation of life's material forces would seem to indicate. Darkness somewhere has its dawn; and roses have thorns; and honey wears a sting, here in this world where love and hate, and life and death are equal kings.

This world never needed noble, active men and women more than now. The antagonism of capital and labor, the inequality of rich and poor, the fight between right and wrong, is in large part due to a lack of that kind of preparation for life's duties which yields assurance and makes the responsibilities of life pleasant. The schoolhouse and the jail are still close neighbors; and too many are yet learning the hard slow lessons of the latter.

Thus we talk about the education of the school, the street, the factory, and the jail, and then we start all over again by asking, just as anxiously as Aristotle did in his day, "What is education?" Today without the manual training element, the education of the three H's, the head, the heart, the hand, is little more than half completed.

Psychologically, thoughtful pedagogic activity is as necessary to the educational ideal, as activity to any form of life. Educational hunger and thirst indicate a demand for that which shall satisfy the requirements necessary to the appreciation of all that life means. Proper nutrition and activity are necessary to the psychic and physical growth and well-being. Without either of them the functional life of brain cell and muscle would fail of realization. This is fundamental in the life of every child, if his eyes are ever to see and enjoy, his ears to hear and understand, his hands to handle with skill and accuracy, and his brain to sit in a pleasing reign, on the throne of a bright and beautiful manhood.

Dr White, in his *Art of Teaching*, gives *knowledge, power,* and *skill* as a trinity of ends in education. Only when the educational effort is guided by a clear and appreciative knowledge of these ends can it accomplish its mission.

The *Commercial Advertiser*, New York, Saturday, Oct. 4, 1902, prints the results of a "Business *questionnaire*" prepared by a special committee of the New York State Teachers Association. As many as 409 prominent and successful business men, merchants and bankers, of New York and neighboring cities, answered these questions. "Do the New York public schools prepare children to earn their living, and how can instruction be improved to this end?" Let me quote from one or two of the many interesting tables. "If we adopt sixty (60%) as the satisfactory standard, we shall find that, judging by the returns, boys may be classified as follows: Satisfactory in truthfulness 66%, cleanliness 65%, desire to advance 60%. Unsatisfactory in reliability 56%, punctuality 56%, manners 54%, ability to follow instructions 53%, economy of time 32%, industry 50%, and economy of materials 35%. The city-bred boy did not succeed as well as the boy from the country." These general defects are noted. Lack of mechanical or manual training, accuracy, economy, thoughtfulness, carefulness, system, attention to detail, self-initiative etc. This report clearly shows that our schools are strong or weak just as they succeed or fail in their great and responsible task of giving a competent introduction to the duties and privileges of life. From a reliable source comes the information that 95% of the most successful and respected men in New York city were country-bred, and that 75% of the successful brokers on the Chicago stock exchange came from the farm. This means that these men had that peculiar training which called for the self-initiative that developed will power.

England, Germany, and France have an established system of commercial, industrial training, and technical schools. It is said that Germany without these schools could not hold her proud position at the head of continental Europe's industrial states, and we may add that France under similar conditions would be relatively weak. What these older nations have found to be of so much help in the growth and development of their commercial and industrial relations, we can not well ignore, but we can and should build better and safer than they, profiting by their experience.

Today education offers the only valuable apprenticeship of life. Our laws make it the legal heritage of every boy and every girl. No child can regulate civilized conditions any more than he can make the weather, but it is his duty and privilege to prepare to meet the demands of both.

President Roosevelt, in his late message, would have every gunner, in our navy, a marksman, and this not more for economic utility than as an argument in favor of peace and good will. To just the same extent our civilization needs skilful, appreciative accuracy along all our commercial and industrial lines. Here the officers need a general, as well as a technical education, and the privates must have a training and skill necessary to an understanding and successful performance of duty. The evolution of our industrial processes, which touches our civilization on every side, has almost amounted to a revolution. This mechanical age is ever on the alert, in its quest for and solution of problems tending to shorten and simplify processes and at the same time increase the power of production. In the field of agriculture alone the number of tools and implements reaches into the hundreds, and the end is not yet. What is true in agriculture is true along every other line. Our skill in metal-working is the glory and pride of our national progress.

What has all this to do with manual training in villages and small cities? Much every way! Education means something more than turning a crank. The foundation stones of its organization are not laid by visiting half a dozen, or more, of the most popular schools and then fixing a happy average. The educator must be discreet and wise, he must have a thorough knowledge of the needs, possibilities, opportunities and responsibilities of his profession, and before writing an educational prescription each case should receive a careful diagnosis. Different conditions of life and a varying amount of time devoted to the work of the school enter as factors into the solution of every problem. Booker T. Washington says that the difference between the industrial North and the South is in the inability of the people of the South to use their hands. A practical knowledge of tools and a skilful understanding of their appropriate use and care are necessary to an appreciation of industrial conditions and opportunities. This is the only road open to efficient and economic results. Lack of preparation here is the great gap between effort and success.

Manual training is not an educational system apart, but a valuable, corporate part of an educational system. It is nothing more than an extension of the laboratory method which is today indispensable to thorough, accurate educational work. Correlated, education and training lay the foundation stones of the self-initiative, and result in a knowledge which is easily converted into active power. This combination is necessary in city and village if the oncoming generations are to be awakened to a lively appreciation of literature, art, science, nature, religion, and the necessary economic application of matter, force, time, and motion, which combine to make the multirelations of life what they are.

The work for boys should give an introduction to tools and instruments, along with a knowledge of materials fundamental in the mechanic arts. The work requires thoughtful accuracy, which reacts to the strengthening and building up of the reproductive and constructive imagination. The necessary attention to detail develops the power of accurate and methodical observation and judgment, and the economic use of time and material. This touches the esthetic as well as the ethical side of life, by making clear the close relations between real utility and beauty, between strength and truth. There is no art where there is no skill, no moral rectitude without accuracy and honesty.

The real value of "domestic science" and "domestic art" for the girls can scarcely be overestimated. The social condition of the domestic atmosphere, to say nothing of the general health and wealth of a nation, is greatly improved and brightened by thoughtfully chosen, carefully prepared meals. The general health of our people, to say nothing of its effect on the social life, makes its own imperative demands for a knowledge, in every home, of the dietetic value and chemistry of foods. If cleanliness indicates our nearness to God, there are abundant opportunities for closer relations in the preparation of food as well as in household sanitation and hygiene. The infant, the invalid, the physical worker, the mental worker, each needs his own special kind of food and care. And it makes a difference in the choice of food and clothes whether one's work is confining or in the open air. Age, health, occupation, temperament and climate are large factors in household and kitchen economy. The home of labor can and should be as happy as the home of capital, with the chances for successful realization largely with the latter class. It should be a place of quiet comfort and good cheer. It should be inviting for tired muscles and aching nerves. The "home, sweet home" atmosphere, " be it ever so humble," should be there. Women are needed today as badly as men. Domestic economy is a science and home-making an art that no woman worthy the name should be without, if the oncoming generation is to be favored in health, wealth and the pursuits of a happy life. That which fills so large a part in the need of every life should find educational recognition and training.

To what extent is it practicable?

Our curriculum builders have in the major part been thoughtful, careful men. A close study of educational growth and development reveals the fact that it was born of necessity, that it has ever grown into a widening field of usefulness, till it now fills the world, that it is recognized by every civilized power as being necessary to the highest well-being of its citizens. The educational differences of nations vary as their civilizations. Where the school falls behind the demands of the age, or fails to recognize her duty and privilege in the advancement of civilization, she betrays her trust and justly falls into disgrace. Being continually confronted with changing conditions and demands, education is not without its trials and difficulties. In the consideration of manual training work for villages and small cities, too much has been made of the difficulties and too little of the possibilities.

Much that is good, in education, has grown into the system, just as a bud grafted into a tree, and has borne rich and abundant fruit. As a corporate part of the public school curriculum, manual training has proved its merit. In connection with our industrial, commercial, and social relations manual training is necessary to the demands made of every school, but its introduction and establishment in any school, barring exceptional cases, is best secured by a natural healthy growth. If you please, learn where, when, and how, the manual training bud should be introduced. It may be necessary, before this problem can be intelligently solved, to visit one or more schools to see what is being done and how it is best accomplished, what the equipment, who the teacher, etc. The educational value of the subject, in its relation to the motor development, mental growth and enlargement, esthetic and ethical worth, and its accord with industrial practice, should not be overlooked.

In the advanced work, wood-turning, pattern-making, forging, foundry practice, and machine tool work, the question of power may enter as a large factor, but, when that time arrives, a number of solutions will occur; however, no case will allow of inferior equipment. This thought should hold rigidly throughout the entire manual training idea. With the right teacher, where joinery is carried on for one or two years, wood-turning could be introduced with two or three lathes and additions made to the equipment from year to year. The same thought obtains for the forging and machine tool work. Some thought and care will be necessary to arrange the work so that all may have an introduction to it. However, the time should soon come when the equipment would be equal to the demands and needs of the work.

Those who desire to look into this matter in detail will find it advantageous to get the "Economics of Manual Training." *Teachers College Record,* v. 2, no. 5. In a chart it shows what manual training work is being given in some 90, or more, of our best advised American schools, covering all the work of the different grades, including the high school, four years. For the work of each grade, or year, you will find a complete list and cost of equipment for a full class, whether for boys or girls, also list and cost of supplies necessary for maintenance, giving cost per capita. This journal is well illustrated, showing classes at work in different schools. Different styles of equipment, for some of the work, are contrasted, and some building plans, with arrangement of equipment shown. This journal gives a bibliography of manual training, "Methods and Practice."

Bulletin 9, May 1900, of the University of the State of New York, high school department, *Manual Training Syllabus,* deals with this subject along the line of a suggestive course of study, with pictorial illustrations, and differentiated for boys and girls, showing sequence of exercises, etc. This bulletin contains a bibliography of manual training manuals.

The *Manual Training Magazine,* printed at The University of Chicago press, is devoted to the discussion of educational thought and practice in manual training, its relation to academic work, and to the mental and moral growth and development.

To what extent should the work be carried?

Reference has been made to the industrial systems of England, Germany and France. While these systems have grown into great popularity because of the material assistance in all utilitarian pursuits, and while a greater effort, to arrive at a finer degree of muscular accuracy and skill, is being exercised, it is pointed out that a new condition, which surely holds a warning, seems to be appearing just above the horizon. The refined industrial effort seems to be more for the commercial worth of the thing expressed than for the educational value in mental growth and the necessary coordinate physical development and intellectual appreciation of ability. The impression is getting abroad that overdevelopment in the requirements for excessive accuracy, of any of the senses without a clear and wholesome appreciation of the esthetic as well as the utilitarian idea, results in arresting the normal development, and in taking out of life that spontaneity and brightness so pleasing in the child life. We are loud in our protests against the evils of child labor. Europe's industrial school system largely involves the make-a-living idea. Necessity has its virtue, but education, while it includes this, must be established on a higher plane. No child should be expected to measure 5 feet before he can reach to 4. America is not without pitiable examples of premature age in mere boys and girls, hardly in their teens, who have been left with heavy domestic responsibilities, due to the death or affliction of one, or both parents. Too early imposed, the exacting demands of life rob youth of its normal health, color, and beauty. Like flowers reared in a dark place, they need the kiss of life's sunshine to bring out the development of their true selves.

It is farthest from the manual training thought and intent to make a continual, living sacrifice to the demands of the industrial and commercial idol. Considered from the standpoint of the highest ideals, a study of the esthetic solely for its commercial value has the luster of the paste diamond. The apprenticeship of the shop is not the apprenticeship of life. Education for sale to the highest wage prostitutes all that is noble, good and true in education.

Finally, there is no halfway house on "Educational hill." There is needed the development of the psychical and the physical, if appreciation and ability are to enjoy the mutual climb to the summit of the experience of all that life, in its highest ideal, means. To this end, the one commendable effort of life is purposeful concentration, the great evil, dissipation. Life is not intended to be merely an adjunct to an industrial machine, nor yet a vague theory, or imagination never to be realized and enjoyed. Man was not made as being necessary to the world, but the world, with all of its appointments, was made for man and his highest growth and development, mental, physical, moral and spiritual, in order that he may go out into eternity with the name of life written on him.

How far shall the manual training laboratory work be carried? It has a vital place and is coexistent with the educational idea and work, and should be found, in its essential elements, in the life work of every school, in every city and village.

Principal L. W. Hoffman — I heartily agree with everything that the paper which has been presented tells us. The generalizations in that paper are true, but I can not say that I understand what answer the gentleman has made to the question to what extent manual training is practicable in the smaller high schools of this State. To my mind the question as stated on our program can not be discussed, certainly can not be answered, without taking up another question, and that is the question of the curriculum of our high schools. There was a time when the high schools of the State of New York did one thing well, they gave a fairly good English education. They taught arithmetic and English so well that it is now the fashion in such meetings as this, as we had evidence this morning, to hark back to that time for an example of the kind of teaching that we want. Today our schools have expanded till the course has been spread out far beyond the limits that it occupied a generation ago. We have on the one side the demand that is made and made urgently that we shall prepare our students for college, and there are few principals who dare stand up in their own communities and say that they are not trying to do that. We have on the other side a new school of pedagogy, that has sprung up while the most of us have been teaching, which says that the chief aim in education is to adapt the child to his life in the world and all that life in the world means today, with the inclusion it makes of all knowledge and of all art. We come up against the demands which become more and more urgent every day, that we shall meet the college requirement and that we shall adapt our boys and girls to the lives that they are to live, and we stand between those two demands. People talk business education to us and they talk manual training to us, and both are good; but how are we going to do these things? It seems to me that the time has come for those who control the course of work in the high schools of the State of New York to take a step which will lead us out of this dilemma. We want either to have a cessation of these demands that are being made on us or we want the way made plain to us to meet them. I do not know what the solution is. I know this, that manual training in a majority of the rural high schools in the State of New York can be obtained only by means of private benefaction or else obtained at the expense of making our work still thinner, still more superficial and worth far less than it is at present. I do not see the way clear to get business courses in such schools. I do not see the way clear to manual training in such schools, unless we are going to find enough men like Carnegie who will foot the bill. You know and I know what it costs to put manual training in the average country school even on the most economic basis. You know and I know that under present conditions and with present resources we can not do it. It is another thing, perhaps, with the city high school and with the city grammar school. It is another thing in a favored town which is worth enough to support schools far above the excellence of most, but it comes to most of us as a very present reality that we can not do this thing.

Principal J. L. Lusk — I have heard of high schools with four teachers and five teachers and seven teachers and eight teachers. The high school with two teachers is doing the work of a four year high school. Then I hear about the work being so different and all that. I have heard it for 30 years, and I wish to give my little testimony here today that all is not gold that glitters. The speaker today has given us an excellent thought; and, as the sun is greater than the moon, so we poor fellows of the rural schools must look to the sun to get inspiration to grow. Let it eclipse the moon if it wants to and drive it out of sight, but we are going to keep on doing our work the best we know how. I know these notions that we hear from some of our great lights about the work being so very poor in the lower grades, and we are sick of hearing it. I know from personal experience that the boys and girls in our schools today at 12 years of age know more than boys and girls did at 16 or 17, years ago. They can read better, they can write better letters, they can figure better, they can spell better. I say that the high school teachers of the Empire State are doing work that is good and creditable; and, for God's sake, give us a little bit of credit. Go to the Regents office and compare the work of today with the work done 15 or 20 years ago. Look at the works on pedagogy in Bardeen's establishment. A few years ago you could not find a book on pedagogy anywhere. It is always growth. Is it true that we are today far behind the teaching of years ago? Do not let us admit it. Why they require more today to enter college than they used to to graduate. They want the boys and girls educated before they go there. They heap in on us scriptural measure. The Regents office is a great blessing to the Empire State. They are doing a magnificent work. They inspire us men and women to plod on and do good work and hold high ideals. But we can not do everything. If two or three teachers in the high school are doing all the work, they can not do everything, and there is no use trying it. We must do the best we can and trust to God and to the intelligence of the Regents office and of the Department of Public Instruction, and they will see us through. I am glad that they have sense enough there to sift out the wheat and throw away the chaff; but let us be honest and fair at these meetings. I believe that the Empire State today is away ahead of what it was 30 years ago; I believe we are doing better work. Let us come here and be honest and square with ourselves and then go back to our school work and think what we are to do, and let us praise the men who are doing so much for the old Empire State. I am willing to look ahead, to climb higher and higher, to hold up high ideals, but I say we are doing the best we can.

Principal Howard Conant — I believe the question now before us is that of manual training. I wish to ask a question in regard to this subject. I do not know very much about manual training except what I have heard about it and what I have seen in the Elmira Reformatory. There is no question that it has accomplished a great deal in that institution, and we think that possibly in our high school it might also do some good. I should like to know more particularly whether it is a required subject in the Binghamton school, and whether it is desirable to have it required; whether the manual training is of a different nature for different students (I mean of the same grade). Are the child's environment and home conditions considered? Is the natural bent of the child encouraged? What is done with reference to the individual? Are there not a great many pupils in the high school that do not need manual training because they have manual training at home? In a city most of the boys and girls have very few duties that require physical exercise. I infer that this is the case in Syracuse from the appearance of the walks around town. Evidently the children get very little manual training outside of what they may get in the schools, and the children in Elmira are situated very much the same. It seems to me that in the country high schools manual training is not needed; there most of the boys and girls do a great deal of work when they are out of school; there they get this manual training by accomplishing some particular thing. That, it seems to me, is the educational value of manual training. I would like to know something about these questions.

Principal Paessler — This question can not be solved independently of local conditions and requirements. Manual training should not be introduced into a school simply because some other school has it. It must first be recognized as a means to the great educational end. Without an appreciative understanding of the place of manual training in the school and the special work to be accomplished by it, the work must fail of its richest results. There was an effort made in my paper to make this point clear. A recognized demand for this work, on the part of patrons and teachers, is necessary to its successful incorporation into any school. Failure to secure the best results must follow where this combined good will is lacking.

Educators are generally agreed that manual training, as an element in education, is needed more in the city than in the country school. Yet the country-bred boy gives his own testimony to the efficiency of the manual training element. This is shown in his expressed appreciation of the ability to think more clearly, decide more wisely, and to express himself more accurately and intelligently than ever before.

Manual training, to yield its largest fruitage, must find an intelligent and thoughtful introduction; it can not be done by recipe. Each new problem should have a thorough and careful diagnosis, and, if manual training is found to answer the educational demand, it should be introduced as a part of the school work. This is just what education means, supplying the demands necessary to the unfolding of the pupil to himself, for his own advantage and the security of our civilization. If this is true, the safety of our country is thoroughly in the hands of our public schools, and what we desire in the citizen we must introduce into the school.

Too many of our pupils are helplessly dependent. To the dependent, life is a rough road and all up hill. We need to develop a larger sense of the self-initiative in our pupils. This requires an appreciating personal contact with things. By way of illustration — a boy in Binghamton wanted some electric stuff for Christmas, and it was given to him. But he had no sooner received it than he wanted to know the difference between a closed circuit, an open circuit, and a short circuit. He wanted to know how to wire a three-way switch, and how to arrange batteries in a series. The matter was gone over just once for him, and then he installed his plant, remembering perfectly all that was told him. It was not a matter of memory, repeating something learned from a book, it seemed that his mind had gotten into the circuit in such a way as to make the whole a part of himself. Surely, this element of personal contact with the fundamentals of real things is the strong feature of our manual training work. Some of the richest gifts of nature are withdrawn because of a failure to appreciate and develop them. The development of the body and mind should never part company, if the ideal life of the human being is ever to be realized.

A definite, satisfactory answer to the question just asked is next to impossible, for it has to do with the whole educational problem which has been solving for many years. The most rational thing to do is to plant the manual training seed into your school and then give it every opportunity for a natural, healthful growth. No educational prescription can be written which will just answer your need without a thorough knowledge and understanding of the case. A doctor who prescribes without a diagnosis is working in the dark, and can not long hold the public confidence and respect. Letters received from some four or five of our best manual training people were uniform in stating that this question took up a new feature of manual training practice. Professor John H. Mason, of Menominee Wis., writes that the subject is finding a large discussion in his own state. This same question will be discussed at the meeting of the Minnesota Educational Association this year.

Principal F. C. White — My friend, Principal Hoffman, says that for the smaller villages manual training is bound to be a matter of private benefaction. That has been the history of manual training in its beginnings, but I believe that most villages will soon outgrow that. That has been our experience in Cornwall. The school was maintained by one of our wealthy residents for two years, and then he said to our board of education, " I want you to shoulder this matter now." The school had made its way among the people, sentiment in the community was in favor of it, and the board had no hesitancy in granting it support. I believe the funds will be forthcoming when manual training is appreciated, and that no school will be too poor to support a manual training department. It is a question of how badly they want it; and, while my friend is right in thinking that in many communities it must be at first a matter of private benefaction, I believe our school boards and our taxpayers are rapidly coming to the point where they are ready to support such institutions from the public funds.

Principal Joseph Edward Banta — Perhaps I can answer a little further the question of Principal Conant in regard to the work that is now being carried on by Professor Paessler. The work is compulsory. The work was started in an independent way and for a year or two was carried on independent of high school work. Then it was thought time for a forward movement, and it was made a part of the regular work. Pupils entering the high school are required to take certain subjects, one of which, physical geography, is required four days in the week. The fifth day a two hour period is required in the manual training department. The girls have domestic science; the boys begin with joinery. When the matter was first proposed for the boys, it was said, " You will find great objection to it." Last year we registered 348 who were taking work in the manual training department, and in not a single instance was there a request from a parent that the rule in regard to manual training be suspended. There are not one tenth as many requests as there are that the drawing be omitted. On the contrary, we find many people coming to us, whose sons and daughters are not yet ready for high school work, and asking that they be allowed to come in and take the work in the manual training department. For 40 weeks in the year two hours a week, or 80 hours of work, are required. Our students grow enthusiastic over it. The boys who come to us from the country, who have had to saw wood, to saw out and nail boards and to make boxes, are those who enjoy it most, and, while we find that they have some deftness of hand, we find that they are always lacking in the matter of accuracy. It might interest you to mention the case of one young man who came to us in the fall. He had grown up in the country and was called a genius there in the use of his hands, and yet he said to me only last week: "The hardest work I have had to do in the high school has been in the manual training department, because there I find absolutely no chance for variation in the work. I am finding out what it is to drive a nail straight, what it is to bore through from opposite sides of a three inch piece and have the holes come together exactly." That was merely stating that he had found out the value of accuracy. Now our population is rapidly passing from rural to urban; and, while perhaps in the country high school manual training is not yet a necessity, in the city high school I believe it is a necessity, and that it should go in as required work; and in a majority of the village high schools that have four or five teachers there is an opportunity for introducing that work and making it of educational value. It correlates a good deal with the other work. The geometric forms that the pupils have met with in the study of geometry are here worked out with a different meaning. The matter of accurate measurement is now an absolute necessity. And so I believe that the paper is well adapted to this meeting, and that Professor Paessler is merely advocating that to which we are coming before the next census of the United States is taken — that manual training shall be taught, if not in the high school, certainly in the upper grades of the grammar school, and that he is merely in advance of the time, and that he has come here to outline work that is well worth following.

———One thing about manual training has been spoken of time and again. The value of the subject lies in the fact that it makes students think. There are quite a number of boys and girls who are considered failures in school because they are not able to succeed in academic studies, higher arithmetic, languages and the like. My experience in teaching manual training last year showed me that this work in manual training brought out the latent elements in the lives of some of those boys who were absolute failures, whose marks were often only 30 or 40, and who were kept grinding on the same old tasks year after year; they found out what they could do, and that they could do something. I remember one instance of a boy who was considered an absolute failure by his teacher, who was really a bright boy and one of the best boys in the manual training class. He could make almost anything. He started right in on his own account and worked it out. That boy will undoubtedly go into some technical school now instead of dropping out of school altogether. He will go into some college perhaps, pursue a technical training and become a civil engineer or something like that. Had it not been for this work in manual training, he would never have known what he was adapted to.

One other thing. Manual training correlates very nicely with arithmetic and some of the other subjects. There are few boys who, even though they know the elements of arithmetic, can use them in a practical way. Manual training presents the subject in an entirely different way. They have the material to be worked up, and they must be exact or they will waste. The manual training teacher who is successful so arranges his work that their judgment is trained, and they are taught to be accurate. It brings into play all the different processes of arithmetic, and they must be accurate or their work will not amount to anything. When a boy is making something that he prizes very highly, he is going to exert himself. One thing we can say for manual training is that it takes a grasp on the boys and holds them in the school longer. When they find that they can do something and are given encouragement in their work, then they will go on with those other subjects and pursue them.

Professor George H. Locke — There is a town in Illinois called Galesburg, made up of two distinct classes of population; one class is from New England, and their part of the town has two colleges in it, the other class is made up of employees of the C. B. & Q. Railroad shops. It occurred to the principal of the school, who is a practical man, and also to the superintendent, that manual training might be put into the high school with a view of helping on some of the students. This was eight or nine years ago. It was put in with an ordinary carpenter at the bench, with an ordinary carpenter's tools, and was allowed to develop as a part of the curriculum, and it was not school work, in that it had no regular connection with it. For the first six months the enthusiasm was not very great, it was a new thing; but by the end of the second six months the boys took such hold of it that it was with difficulty they were able to close the room at night, because the boys wanted to work. This, by the way, was all after school hours. During the second year the boys petitioned the superintendent that they be allowed to bring lanterns to supply the light, and they would give something to the janitor if he would remain there, so that they could work till half past six. It was taught, not by a special teacher, but as something outside the school. Those boys that came from the manual training course developed into better boys. Just as the speaker said a moment ago, the boys who had failed absolutely in arithmetic, or in geometry, understood the arithmetic better, or the geometry better, when they came to use it in connection with their work. As soon as they began to see the application of geometry to the work in hand and the application of arithmetic or various other subjects, they brought up those subjects. That is an example of what is going on in many places in connection with the course in manual training where it is given a chance to live. As a result of this, it seems to me we have a right to say that manual training deserves a place because of the boys that it has saved to education. That sort of thing, even if you have only isolated instances, shows that there is an ethical end in manual training just as in other subjects, and it will give the boys an incentive to go on and do more and better work; and therefore I think it deserves a place in the school curriculum.

[It was moved that the discussion on manual training be closed, and the conference take up optional topic no. 10, high school societies. The motion was carried.]

HIGH SCHOOL SOCIETIES

Principal Joseph E. Banta — I have received letters during the last two weeks from several principals asking that we take up here the subject of high school fraternities. Taking the topic as it stands, "High school societies," there is a threefold division. First those societies, which in some schools are called congresses, in other schools debating societies, in other schools (the ladies' side particularly) literary societies, Friday clubs, or scientific or musical clubs. Each I believe a splendid institution, and each has its proper place in connection with high school work. If these clubs are literary or scientific or art clubs, they are under the direction of some member of the faculty and are receiving constantly suggestions and advice from him or her. You have heard here in these meetings in various years more or less about the high school congress of the Syracuse high school, and I believe we will all agree that such an institution is a splendid thing in a school. Let us eliminate these from our discussion. There is a second class, partly literary and partly social, and these in the main I believe are doing a splendid work. Their literary work is supplementary to and carried on in connection with the work of the high school. The social side is under the direction of some member of the faculty, and these societies are doing an excellent work. There is a third class that passes more frequently under the name of school fraternities, usually a Greek letter fraternity. These are a comparatively new institution. The origin of these fraternities is easily traced; it is an attempt to follow the college. It is strange that in all our high school work we are imitating that which in the college is the worst and are failing to take up that which is best. Now in the college a Greek letter fraternity has its place. Take Hamilton or Colgate University or Williams College or Amherst or any one of 20 others that could be mentioned. The social life of the students will be neglected unless there is some organization in which the young men come together for a social pleasant time. But bear in mind that the conditions of our high school students are wholly unlike that. 99% of our high school students live at home, and the social functions of the home are those in which they are taking part. The parents are interested in the social side, oftentimes, more than in the educational side, and the pupils have from the home all cultivation of the social side that is best for them during their adolescent period, during that period in which they are getting ready for college or making their preparation for life; so that the conditions of the two, the Greek letter society in the college and the Greek letter society in the high school, are wholly unlike. The one has its proper place, I believe; I speak as a fraternity man, and I speak also as an honorary member of several school fraternities. I believe in college they have a place, and yet a few years ago discussion was rife in regard to the value of these societies in college. But, admitting their worth there, because they aid in the development of the social side and in having some social life in connection with the intellectual life of the college, this does not obtain in the high school. The parents are furnishing generally in the home enough for the social side. The majority of the students are connected with Sunday schools or are connected with churches and are getting social life from that side, so that there is no necessity to have in addition to it a Greek letter society or fraternity in the high school.

Not only is it not a necessity, but it is a positive injury along various lines. First, it begets an undemocratic spirit. The public high school supported by public funds is no place for cliques; and yet, in every school in this state where there is a Greek letter society, there is a clique that is made up of the members of the society, and so it is doing just that which the public school ought not to do, begetting an undemocratic spirit. In the second place, these societies lead to friction. Those who are not in the fraternity are constantly being told, " You amount to nothing; you are not in our fraternity." Those outside say, " We will oppose you and naturally you will oppose us in the election of the senior class president," and so this friction begets an ill feeling that the students carry out with them from the school. In the third place, they interfere directly with the work of the school. The high school is a place for study; but you take the average high school student, 14 when he enters, 18 when he gets through, and his mind at that time is fitted for carrying a certain amount. Fill his mind full of society, and there is no room for attention to school work. I am speaking now from experience. When once he is in a society (and the matter is being pushed on him all the time) he becomes hostile to the fellows around him who are not in the society and gets so puffed up that there is no opportunity for his doing the work of the school. Very quickly he falls behind his class. Then it is that the attention of the parent is called to it, and he discusses the matter with you. You try to show him the cause for it, but he will not see the cause for it as you see it.

In the fourth place, it leads to friction with the authorities of the school. Let a member of a fraternity be disciplined, be it never so justly, back of him and supporting him every time is his fraternity, and in the gatherings to which the students come there is fomented opposition to the authorities of the school. I mention these four things as fundamental, in which they are a direct menace to the interests of the school. How can they be removed? A year ago I had correspondence with 13 of the principals of the larger high schools of the State, and in all of these except three it was admitted that Greek letter fraternities existed. Only one principal had a word to say in their favor, and that principal has drawn the lines very strongly as to their control. You will all agree with me in this, that there is no student organization independent of oversight in some way by the faculty in which there is not a tendency to degenerate. Leave your athletics in the hands of the pupils, and by and by you will have to apologize for something done that was ungentlemanly. Leave your school publications wholly in the hands of the students, and by and by the same thing takes place. But in the case of the fraternity the whole purpose is to be independent of the faculty and of any restriction whatever, and so the tendency is all the time to degenerate not only in scholarship but in regard to the attitude of the students toward the school authorities and in morals also. The principal who spoke a word in their favor has the lines drawn very strongly over the fraternities in his school; but, if the personal element should drop out in the head of this school, I assume that there would be friction at once. I believe it is generally admitted that outside of the school our authority over our students ceases. Consequently, where they meet in rooms rented for the purpose, there is no opportunity whatever to lead them directly, it must be indirectly done; and, when the effort is made to say that they shall meet in only such a place, once in so often and on such a night and during such hours, there is opportunity for the friction that has arisen in various places. I believe the whole tendency, as I said at the beginning, is toward degeneration, and that it is time that this body or some body of teachers expressed its opinion as thoroughly opposed to them and its belief that they are not a good thing, in order that the friction that is constantly arising may be in some measure averted. Each fraternity is now sending out its members to various other schools to organize chapters; and, while the first year these results do not always appear, where they have continued for five years these results that I have mentioned have invariably occurred. I speak now from experience. In my own school I found five on entering the school two years or more ago, and I found that some friction had already existed. I called together representatives of the different fraternities and suggested certain remedies which they very cordially accepted. Complaint was coming from the grammar school principals daily that members of the fraternities were going down to the grammar schools and pledging men to belong to this or that fraternity, and they asked that it be stopped in some way. I called representatives of the societies together and said to them, "Ought not this to be stopped, and would not it be a wise thing to limit your membership to the two upper grades in the high school (that is the 11th and 12th grades in our school) or at any rate to the high school?" They talked the matter over and finally decided that they would put it in the middle of the 10th grade, and we came to an agreement on that; but within three weeks three of the fraternities had broken over. The very action that they had taken made it necessary to go to the office to know who was eligible and in failing to do this there was this breaking over. That made friction at once. Finally, the matter reached this point that the board called for a public meeting. The parents appeared, and not a parent had a word to say in favor; many parents had something to say against the fraternities. The board deferred action, but finally drew up certain resolutions which they asked the fraternities to embody in their bylaws. One was that a person should not belong to a fraternity till he had reached the 11th grade; that he should not join the fraternity unless with the consent of his parents, to be filed with the principal of the school; that, if a member of a fraternity was disciplined and compelled to leave school, he should leave the fraternity at the same time. The fraternities were asked to adopt these as bylaws or in some way incorporate them into their minutes. The fraternities came together and discussed the matter and decided that they would not do these things, and that led to the action which you have seen somewhat generally reported throughout the State, that the fraternity shall have no official connection with the high school. Now, while they have no official connection with it, morally they have some relation to the high school; and as a member of the faculty I am weekly approached by some parent who finds fault with what has been done in a particular fraternity. They say: "You should have something to say about it. The high school is a good thing, and we assume that the fraternities are a good thing, and, when son or daughter came to us to ask if they might join, they said it was a high school fraternity, and we then gave our consent; but we find later that there is a large expense involved, that there are monthly dues and sometimes weekly dues, that at least once a term we are expected to entertain the fraternity, and that entertainment is more or less expensive, and consequently we do not feel satisfied at all." Instead of looking back to the fact that it was for the parent to decide and not for the school, they invariably hold the school responsible; and, shirk that responsibility as we may try, we are morally responsible in the eyes of the parent. So I believe that, for the reasons I have mentioned, the high school fraternities are an evil and menace to the best interests of the high school, undemocratic, tending to degeneracy, tending to dissipation of energy, throwing in the fraternity that which should go in the work of the school, begetting friction in the school and opposed to the authority of the school.

Principal Schuyler F. Herron — Mr Abrams and I have been talking this matter over a good deal, because we each have three or four fraternities in our schools. We have had no trouble at all with these organizations. We wish that distinctly understood. But we have felt that there is a chance for friction, and we had thought that perhaps the best plan would be to ask those men who have fraternities in their schools to get together this afternoon and have a sort of round table discussion. It occurred to us that perhaps we might clear up our ideas a little about it and arrive at some conclusions which would help us in dealing with the problem which seems to us of considerable importance. I do not believe, I am free to say, that we can abolish the fraternities. I am afraid that the action taken in Binghamton can not be duplicated in most schools, even if it were advisable. I am also inclined to think at the present time at least that it would have small effect.

The bare fact that we refuse to recognize an organization would not take it out of existence. There is one thing we could do of course, and I have had occasion to do that once or twice — we could prevent their assuming the name of the school. I think there is no doubt about that at all. They have no right legally to attach the name of the school to something that the school does not recognize as connected with the institution. It seems to me that the school board might take legal measures if necessary to prevent their using the name of the school or attaching the name of the school to the name of the organization. But, while we recognize this as true, we must also recognize that the boys are pretty tolerably certain under present conditions to have these organizations. It may be of interest to note one or two items that Mr Banta has not suggested. First, most of these organizations started in Utica. A good many of the suggestions that come to the chapters in the various parts of the State come from the Alpha chapter, and these suggestions are largely harmful. It has been mentioned that these boys are inspired with a feeling that their importance is very great. As an illustration of this, in one of their last conventions, without disclosing the name of the organization, I may say that the alumni attempted to have an amendment incorporated in the bylaws whereby the grand lodge officers should be alumni. They thought that perhaps a collection of schoolboys would not be the very best persons in the world to manage an organization of consequence. The amendment was voted down, four to one. I have had one or two slight instances this fall in almost the same direction. It occurred to me that perhaps our organizations ought to meet all the same night in the school building, and I suggested it to them in a rather tentative way, and I found they were greatly worried lest the other organizations should find out valuable grips, passwords etc., and so the matter was not pressed. But there you have their attitude. I know of one school (not my own) where a boys' organization, against the advice of the principal, obtained rooms down town, and those rooms became so objectionable in every way that the better sentiment of the school demanded that the boys should meet in the high school after that. Within a few weeks they have decided again to go down town and have rooms there. The official head of the organization recently visited Herkimer, and in an eloquent speech he advised the boys that they should by all means have rooms down town, "to read the best books and talk them over." I was a school boy recently enough, so that I know pretty well just what would happen if they got together. There is no doubt about it. A number of the boys would be smoking cigarettes, and other things would happen. It would be thoroughly objectionable in every way. And there again you have the attitude. They refuse absolutely to elect alumni officers of the organization or society, and they wish to get rooms out of the school building, feeling all the while that any sort of control is obnoxious. The net result is that those of us who have these organizations in our schools ought to get together; possibly a committee ought to be appointed to consider the matter and find out what can be done and report at some future meeting, because, as Superintendent Banta has said, the question is fraught with a good deal of danger. The secret fraternities injure materially the work of the high school, and they may do that without any intention on the part of the boys or girls that such will be the final result.

Principal A. J. MacElroy — I should like to suggest that possibly it might clear matters up a little if we knew what the status of these high school fraternities was with reference to having chapters that have no official connection with the high school. As we all know, with the college fraternities, when the faculty of the college decide that fraternities shall not be represented, there the charter is withdrawn. It seems to me that, if the high school fraternities have no such regulation, we ought to pass on the whole business, and we ought to do it as a body. I have no high school fraternities in my school. The boys and girls both came to me and said, "Why can't we have a high school fraternity?" I talked with Principal Banta of Binghamton, and I decided as far as I was concerned and suggested to them that it would be time enough for them to consider fraternal matters when they got married or went to college.

Principal Herron — They do not expect to ask any favors of the faculty of the school. The boys and girls realize fully that I sympathize with what they are trying to do, but they have no notion of asking about anything of that sort. I know positively that this fall a number of organizations have been established in various schools of the State by the formation of local chapters where the permission of the faculty has not been thought of in any particular case.

Principal F. H. Brown — My knowledge of the question is somewhat limited; but thus far I feel inclined to stand on opposing ground to the last speaker. I have found the boys and girls in my school better as members of a fraternity, most heartily in sympathy with good order and all those things. We do not oppose the organizations, but hold them accountable for the good name of the school. I find them entirely in sympathy with the faculty. I find them willing, anxious and earnest to do all things in their power to make our school stand high, to hold membership in an organization as a sort of prize, and the boys and girls of the under classes know that, when they have attained certain standings, they will then be eligible to the society; and they are constantly working with that aim in view and hoping that the time will soon come when by their standings they shall be entitled to walk into that honored fraternity. The meetings are held formally in the school building at stated intervals. No meetings are held unless the principal of the school, the vice principal or one of the teachers is present on the cordial invitation of the members of the society; and thus far I have seen nothing but what would be an honor to older fraternities of which I have had the honor of being a member. I may because of my innocence, not having had long experience, be treading on dangerous ground. I have visited the societies, I have listened to the eloquence that has been poured forth from the rostrum, and I believe that the work was equal to that of any class in the school. I believe the influence exerted by school societies to be good alike for boys and girls. If I am deluded, I certainly hope something will be brought before me today that will wipe out the delusion.

Superintendent George Griffith — Inasmuch as Utica has been referred to as a source of contagion in this matter, I wish to say a word or two. The subject was a new one to me; and, since it was presented to me last night, I have thought over the influence and work of the fraternities that are in our high school. Four of them have been there during the whole 10 years of my supervision. I can not think of any injury they have done; I can think of some good.

The other thought that has occurred to me is this. If they are connected with the school officially, we can control them somewhat; if they are not so connected with the school, the question arises, what are you going to do about it? I can not think of any way officially or unofficially that we can handle the matter. If the boys or the girls wish to associate themselves together in clubs, it is the parents and the parents only that can stop it. We had better take the thing as it is, influence it for good as we may, and get the best out of it we can. I think from experience and observation that there is a great deal of good that we can get out of it.

President Fosdick — I do not suppose it is exactly parliamentary for the presiding officer to leave the platform and take part in any discussion, but I am very much interested in this matter of high school societies. I presume there is danger in almost all things connected with our work. I sometimes feel as though I were sitting on top of a volcano that has for a long time been extinct, but there is no telling when the thing will go off. This feeling of insecurity applies to athletics, to debating societies, to all school functions where you have a thousand to twelve hundred boys and girls under your supervision. Fortunately or otherwise — I consider it fortunate — when I took hold of the Masten Park High School in September '97, we had no traditions. It was a new school. I was its first principal, and whatever history it has, it has made since it was started, of course. There came up early in the spring of '98 the question of fraternities. Like my friend, Superintendent Banta, I am a fraternity man. I had looked the question over very carefully before the boys came to me — and

I want to say here and now that I can not conceive of a principal of a high school worthy of the name who does not to a greater or less extent win the confidence of his boys and girls, so that they will come to him voluntarily to talk over matters that concern their welfare and the welfare of the school. My resignation would be ready for Superintendent Emerson tomorrow if I thought the time had come when I could not command the confidence of my boys and girls. Well, the boys came to me to talk over the matter of fraternities. They wanted to know if I had any objection to them. I said I wanted time to consider the matter, and the subject was dropped for the time being. Later the same boys came to me again, and I said: "Boys, I have no objection, but please bear in mind that I can not give your fraternity any official recognition; and I do not wish you to go into this without the consent of the folks at home." After consultation with their parents, there was formed a fraternity in the school. Today I am the happy father of five boys fraternities and three girls sororities, I believe they call them, and I know the ins and outs of all of them. I know when they meet, I know where they meet. I have a list in my office of the boys and girls belonging to the different fraternities, and this is corrected twice each year by the secretary of each society. While I sometimes wish there were no fraternities, I am very glad to use them for the best interests of the school. How is this done? Well, in various ways. For instance, the other day it was reported to me that one of the fellows was slighting his work. I consulted the list and found that he belonged to one of the best fraternities in the school. I went to two of the prominent members and stated the case to them. They replied, "We'll fix the matter up"; and in a day or two the young man came to me and said, "Mr Fosdick, I am sorry you reported the matter to my fraternity." That boy for four weeks has accomplished more and done better work than in any other corresponding time since he came into the school. What screws they put to him, I do not know, but I can imagine.

"But how," you will say, "about the chapter house and the society rooms?" Well, we have no trouble over that. I can not be held responsible for the actions of my boys and girls all the time, though in some quarters the attempt is made to roll that burden on me. How can I, the principal of the school, interfere with the fraternity rooms when the parents will supply rugs, when the father of one of the boys will put in a piano, and another will furnish pictures? While I recognize the dangers, while I understand all the difficult questions that naturally come up, I have yet to feel, personally, the first signs of friction, and I find much in this phase of school life to commend. I agree with Mr Banta in what he says about the undesirability of immature minds aping the customs of college life; but the boys and girls will do it, and so long as they have the support of their parents, it is the part of wisdom for the principal to utilize this movement for the best interests of the school. Years ago I learned not to interfere in family affairs.

I said in the beginning that these fraternities received no official recognition. I do not visit these societies officially, for I consider that I have no right to do it. Any time they wish to have a little business meeting, they will come to me and say, "May we have a business meeting after school for a few moments?" "How long will it take?" "Half an hour perhaps. You can come in, Mr Fosdick, if you wish." I could be an honorary member of five boys' and three girls' fraternities if I chose. Most of them have proffered me that honor, but I have steadily declined it. I have simply said: "Boys, I can not do it. Suppose it is known that I am an honorary member of your fraternity, and one of your members comes up for discipline. I lay myself open to charges of favoritism. I must keep myself free and untrammeled, so that no one can accuse me of partiality in dealing with all scholars." I think teachers make a mistake in becoming honorary members, and I have advised my faculty to decline such invitations. Now I recognize all that has been said derogatory to clubrooms, but that is outside of my bailiwick, for the scholars have had the consent of their parents.

A short time ago the boys of one of the fraternities sent me an urgent invitation to call at their clubrooms that evening.

I was glad to go, and I met there some thirty of my boys, some of the best fellows I have in school, full of boyish life with its fun and mischief but after all with that latent manhood that I believe inheres in a great majority of boys. They had drawn up a new set of house rules and wanted to know if I approved them. My friends, I had had things in my school life that touched me; but, when the boys of that fraternity would invite their principal, urge him to read their house rules, and ask him to approve them before their adoption, it went pretty deep. I read over the rules and found they were more stringent than those of any club to which I belong. And they are lived up to rigidly.

I leave off as I began. There are dangers; but I believe they can be minimized, and that these fraternities if rightly handled, if handled in a spirit of confidence in the boys and girls, can be made to serve the highest interests of the school.

ST LOUIS EXPOSITION

Dr Henry L. Taylor — You will remember that Director Rogers was with us a year ago. In July the State Teachers Association appointed a committee to organize a conference committee representing the educational organizations of the State of New York. They were invited to form a temporary organization and met in Albany in October, each organization of the State being represented. They found that they needed definite powers and wished to perfect a permanent organization and referred the matter back to the individual organizations for power to act. Meanwhile the St Louis Exposition is advancing steadily in its development with the purpose of opening in 1904. New York State by act of Legislature established a St Louis exposition commission and appropriated $100,000 for its expenses. The original act specifies five distinct lines to be exhibited at St Louis: 1 Educational: 2 Industrial; 3 Commercial: 4 Artistic; 5 All other interests. That commission was appointed by the governor in August or September and organized recently, appointing a chairman and secretary and opening rooms in New York city. The conference committee temporarily organized, representing 11 organizations, has put these organizations in contact with the commission and has asked, first, that it be permitted to name a director of the educational exhibit of the State of New York, and second that it be given funds for the preparation in the next year and a half of a representative exhibit of all New York State's educational activities. They have the promise of the commission that what this conference committee asks in a reasonable line will be granted. The first request of the committee is that it be given a director who shall have full charge of the entire educational exhibit; second, that they be given one fifth of all the moneys appropriated by the State of New York for the St Louis exhibit as a basis for preparing the exhibit. Seven of the 11 organizations have already appointed permanent representatives, and we ask you this afternoon if you can not lend us the influence of your body and appoint a permanent representative on that conference committee with power to act, and if necessary to spend of your funds in the initial stages of the work a reasonable amount to carry the matter forward, so that a most complete representation of New York's educational activities shall be exhibited in St Louis in 1904.

[*Voted,* That the executive committee be empowered to use their judgment in this matter and appoint such a representative as they see fit.]

Tuesday evening, December 30

President Fosdick — I can not tell you how disappointed I felt when, some five or six days ago, I received a letter from Superintendent Blodgett saying that he would be unable to be here tonight; and he added the comforting assurance that no doubt I could find some one to take his place. After I had recovered from the paralyzed condition caused by this announcement, I wrote as sympathetic a letter as I knew how to indite, telling him of the embarrassment in which I was placed and asking him to find a substitute. We are all disappointed in his absence, and yet you will agree with me, I am sure, that in providing the speaker on the platform Superintendent Blodgett rather outdid himself. I know of no one better fitted to appear before the

Associated Academic Principals than the man who will stand here morning after morning in the coming months and tell the boys and girls how "not to do it." It is with great pleasure that I introduce to you Prin. W. K. Wickes of the Syracuse High School, who will talk to us about the "Strike of the Schoolmasters."

THE STRIKE OF THE SCHOOLMASTERS

The History of a Curious Episode which has Never Before been Written

BY PRINCIPAL WILLIAM K. WICKES, SYRACUSE HIGH SCHOOL

Mr President, Ladies and Gentlemen: I do not feel exactly like a strange cat in a garret, but I do feel like a cat in a strange garret. I too am sorry that Superintendent Blodgett is not here this evening, because his subject was to be the relation of principal and teachers to superintendent; and, when he told me that he would not be able to be here, I expressed my sympathy, and then, trying to be loyal to him as superintendent, I said, "Is there anything I can do for you," and he plumped on me for this.

I am to speak on the strike of the schoolmasters. This topic, as I shall treat it, is descriptive rather than didactic. You have had enough of didacticism in the past two days and may relish something of another sort. It deals with the characteristics of schoolmasters rather than with the curriculums of schools. It is perhaps suggestive rather than conclusive, and when I speak, as I presently shall, about Mr Headstrong, Mr Practical, Mr Pugnacious, etc., I do not want you to think of somebody else and say to yourself, "That is him," because, in the first place, that would be bad grammar, and, in the second place, I assure you that I have no personal reference to anybody who may be present in the audience, or indeed to anybody that ever existed so far as I know except in my imagination.

'Twas in the summer of 1890, town of Blank, State of New York, that several scores of pedagogues met, by appointment, to talk over the educational situation in general and their own prospects in particular. A practised eye could discern in some faces an air of determination, and in others an ill-at-ease expression, overcasting, like a cloud, the usual sunlike serenity of their features. Indeed, the men themselves were a study. They were so widely different, one from another, in hight and weight, in garb and gait, in locks of brown, or black, or snowy pate; yet all alike revealing an indefinable something which stamped them beyond all possibility of doubt or deceit as pedagogues. Pedagogues! Illustrious name! At mention of it, your historian must pause to breathe a blessing to the memory of Ascham, Milton, Emerson and a shining host of others, who have guided the feet of youth into ways of pleasantness and paths of peace.

As the hour for the meeting drew nigh, the pedagogues, leaving the birds to their morning carols, and the flowers to their fragrance, walked into a schoolhouse whose every window was closed, while the air was heavy with the invisible but irresistible spirit of drowsiness. "Ah, how homelike!" exclaimed the brethren. "How good it is to be here!" For it brought back to their minds — this schoolhouse did — the various places whence they came, where they were wont to pass their waking hours, and thoughts of which had been with them on many sleepy evenings, sleeping hours and sleepless nights.

Just then the weazened tongue of a cracked bell proclaimed the hour of *nine*. The effect was magical and beautiful; as with a common impulse they fell to singing, in that indescribable, incommunicable way of singing which schoolmasters have.

School, School, Sweet, Sweet, School!
Be it ever so dingy,
There's no place like School!

Then there were loud cries for "order, order," though the audience surely had been peaceful enough; and a tall voice rose above the cadences of the call for order, and nominated Professor Pax as chairman of the meeting. A name so suggestive of peace and quiet chimed in so well with the pacific character of a teacher audience, that there were a score of seconders, and Professor Pax soon rose to the chairmanship on the triumphant wings of a unanimous vote, and seated himself at the master's desk, "deepscared by raps official."

And then, somewhat as you may have seen the doors of a toy house fly open, a toy bird fly out, utter a toy note or two and retire, so did the gates of speech of Pax fly open, a timid voice peeped out "Will somebody please state the object of this meeting?"— then straightway the voice disappeared.

Professor Pax's voice had scarcely sunk into silence and his form into a seat, when Mr Headstrong sprang up, like an erewhile couchant tiger, from the jungle (or jangle) of his plan, and he said: "Mr Chairman and fellow pedagogues, there comes a time in the history of every nation, every community, yea every thinking individual, when protest is the dominant note in the national, commercial or individual life. Sometimes this protest leaps from the cannon's mouth, and a nation is plunged into the horrors of foreign or fratricidal strife; sometimes the protest is in matters of religion, awakening persecution most cruel and relentless; sometimes a community protests against the acts of its local government, or the individual flames out against the hard conditions of his environment. Indeed, sir" — just here the gavel of the chairman fell, and Professor Pax rising said, "As there is no question before the assembly, the gentleman is not in order in speaking unless he intends to submit a motion or resolution." "Mr Chairman," replied Mr Headstrong, "I do intend to submit a series of resolutions, for, as this learned body is well aware, the order and [illegible] of all true pedagogic psychology demands the gradual development of any theme rather than that sudden plunge in medias res which the fiery spirit of a young [illegible] might dictate. [illegible] my theme [illegible] in [illegible] this [illegible] audience. Mr Chairman, I beg to submit the following resolutions:"

"Whereas, There comes a time in the history of every organization designed and carried on for the benefit of others to protest against such a condition of things as militates against the wisdom and [illegible] of its [illegible] influence, and

"Whereas, The ancient and honorable order of schoolmasters is such an organization, and

"Whereas, In the opinion of this assembly the time has come for such protest, therefore

Resolved, That this assembly views with alarm,

1st, the uncertain tenure of office among the men and women of our profession, specially in the countryside and in our district schools, where the teacher employed today may be discharged tomorrow;

2d, the scanty pay, the starvation wages doled out to thousands of our fellow laborers in the great harvest fields of education — and that, too, though the great Empire State pours out so bountifully from her treasury to lessen the burden of district and village and city;

3d, the many inconvenient, inadequate, and altogether unlandworthy buildings in which our youth are compelled to spend the major part of their time, buildings so poor as to have deserved and received the severest condemnation of the State Department of Public Instruction;

4th, the lack of such regulations, with power of enforcement, as would ensure the best use even of poor buildings, coupled with the lack of such facilities in the way of books and maps and charts, etc., etc. as might greatly aid teachers in dispensing, and scholars in receiving knowledge;

5th, the use in many schools of such textbooks as sound scholarship and common sense can not approve, books honestly adopted years ago, and still adhered to through an unwise conservatism, or foisted on schools by textbook firms that know how to do it, and kept in use by the same sort of business keenness;

6th, the compulsion on many teachers to instruct so many, or such large classes, or both, that the mental good the teachers might otherwise do is hampered, and the mental good the pupils might otherwise get is retarded;

7th, the glut, in very many schools, of examinations — sometimes so constant, so prolonged, that the examined ones become well-nigh ex-animate ones;

8th, the lack of a certain independence of action, which, not looking for, nor wishing for, despotic sway, yet feels itself trammeled by many influences hindering the needed exercise of such action;

9th, the lack of a recognition on the part of the public of the indispensable and important character of the work teachers are called on to do — a lack which we as teachers do and must see and feel;

10th, the failure of the state Legislature to take definite and favorable action on the proposition to pension such public school teachers as have toiled for a full generation in the pedagogic service of the State;

11th, the prevalence of dyspepsia among the members of our profession, brought on by the sedentary life we lead, and in town leading us to an altrabiliousness of disposition utterly alien to the exercise of a cheerful influence;

12th, the existence among our own members of what may be called educational politicians, whose habit it is to visit all educational gatherings — against the exercise of which right, surely we have nothing to say — and there ever talking, never saying anything new, always doing their utmost to manipulate and manage the offices;

13th, the existence, outside of our calling, of certain political influences which may operate to imperil the best interests of schools;

14th, the inconsiderateness or unwisdom of some parents in demanding for their children certain privileges or exemptions, not asked for in the interest of good discipline and scholarship;

15th, the pertinacity and even pugnacity of book agents, who visit us when busiest, stay longest when we fidget most, and attempt to flatter us into buying by saying. "No indorsement like that of a teacher" — saying the same thing, when needful, respectively to lawyer, doctor and priest;

16th, the presence among us of certain bread-and-butter teachers, whose sole aim seems to be to win that baked-and-spread commodity. paying no heed to the responsible character of the work they are set to do. giving no thought to the deepening and strengthening of their own intellectual life, or to the unfolding of that life in the minds and hearts of their pupils;

17th, the manifestation of an angry spirit by us when we are crossed in the doing of something we know to be needful and right;

18th, the inclination, now and then, by us to revenge, with the effect, perhaps, of harming those who are entirely innocent in the whole matter. Therefore,

Be it resolved, That we strike!

"Mr Chairman, I move the adoption of these resolutions."

At once a half dozen men sprang to their feet and demanded recognition by the chair. The earliest to spring, the loudest to cry out was, of course, Mr Impulse. Having become entitled to the floor, he spoke as follows: "Mr Chairman, I most heartily second the motion for adoption. Who can hesitate to give his heartiest concurrence to sentiments such as those to which we have just listened? Who does not feel to cry out with John Milton, 'Avenge, O Lord, thy slaughtered saints'? Sir, if we are content to remain quiet, taking no steps toward that freedom which now seems almost within our grasp, what hope can the future hold for us? Sir, 'There is a tide in the affairs of men'; we should take it 'at the flood'—it will then lead us on 'to fortune' and to freedom. I trust the motion will prevail."

Just here the historian must be allowed a slight digression. The famous convention of 1787, which adopted our national Constitution, resolved to destroy all the papers of the assembly. In like manner, it seems, the schoolmasters convention of 1890 determined to burn its papers; but, as in the former case James Madison took careful notes of all proceedings, so in the latter case a thoughtful pedagogue did the same; and it is to his thoughtfulness that we are indebted for such notes as have rendered possible the narrative we are now giving.

When Mr Impulse sat down, there was some clapping of hands, but the applause was by no means general, and it was clear to see that there was a wide difference of opinion either as to the inherent wisdom of the resolutions, or as to the policy of striking as a remedy, or perhaps as to the propitiousness of the time for such a pronounced and radical step. Moreover, it was very curious that nobody seemed to notice that the strike had not been declared against any persons in particular—neither against trustees, boards of education, the *public*, parents, doctors—who should at all hazards have prevented the dyspepsia — nor against the assembled teachers themselves, since the resolutions arraigned them for unpedagogic anger and revenge. And, if

> The gun well aimed at duck or plover
> Recoils and kicks the owner over,

what must be the recoil of resolutions not well aimed, or rather, aimed at nothing!

But the spirit of talk was up, and so too was Mr Reminiscence. He was a man of years and experience, and regarded as belonging to that class described by Cicero as "praisers of a time gone by." To the astonishment of the audience, however, he spoke somewhat deprecatorily of the pedagogic past, and by inference at least in favor of the pedagogic present. Yet his voice was faint and suffused with emotion, as though it cost him an effort to break with the past; and thus it came about that the faithful chronicler of the assembly could not catch all of the broken utterances of the man. He heard and noted enough, however, to show that the speaker could not say with Wordsworth, "The thought of my past years doth breed in me perpetual benedictions"— indeed more nearly maledictions, as he spoke of the wretched schoolhouses of the early days, of the horrors of "boarding 'round," of the tramps through wintry snows, such as never fall in these degenerate and lukewarm days, of early making and constant tendance of fires, as he held in one hand the poker to defend from Jack Frost, and in the other, the rod to protect against the power of Misrule. "Gentlemen," he said, "let us, having food and raiment and shelter, be therewith content."

The sentiment just recorded received an answering echo of applause. Yet it was not allowed to go unchallenged, for straightway Mr Ambition, regardless of the fact that "by that sin fell the angels," gained the floor and poured himself out as follows: "Mr Chairman, the gentleman who has just taken his seat has carefully concealed the fact that in those early days the schoolmaster was the oracle of the place in which he abode, the people looking on him and up to him as the impersonation of wisdom —

> And still they gazed, and still the wonder grew,
> That one small head could carry all he knew.

Now I confess, sir, for myself, that I am anxious to see the return of that departed day, the renewal of that old-time reverence, the abandonment of that leveling process which is fast abolishing all former distinctions between ignorance and learning. In the blessed days of yore, sir, the schoolmaster was a great man in the community, dividing with the minister, share and share alike, the awe-inspired veneration of the town. Whoso is inclined to disbelieve or deny this will do well to look at some of the old pedagogic notices that certain modern pedagogues are forever quoting and eulogizing. And I beg you to note, also, the hight to which Ichabod Crane, the schoolmaster, attains in the felicitous pages of Washington Irving, a hight which made it possible for him to aspire with good expectation of success to the aristocratic hand of Katrina Van Tassel! But, sir, those halcyon days of social and intellectual prestige are gone, forever gone, unless we show to the world, here and now, that we resent our downputting and are resolved on our uprising — yea, that we can be satisfied with nothing less than a complete rehabilitation in our ancestral prerogatives, privileges and perquisites."

Just here the gavel of the gentle chairman fell, and his timid voice peeped out the suggestion that such "long-tailed words in 'osity and 'ation" should not be allowed to obscure the vital point at issue, and he half intimated that the speaker had used such words for the express purpose of perplexing and dashing "maturest counsels." To this severe reproof Mr Ambition was heard to mutter as he sank into his seat, that he denied the allegation and defied the alligator! But nobody who knew the gentle Pax would ever suspect him of any crunching propensities, so Ambition's roar died harmlessly away.

But now the "combat deepens," for Mr Pugnacious claims and gets the floor — gets the ear of the house also, and pulls and bites away on it in most approved cannibalistic fashion. Your historian would be glad, in the interest of true and complete history, to recount all that the speaker said. But the honest truth is that he spoke so fast and withal roared so loudly that the echoes of his voice, tumbling in on the audience like the multitudinous waves of the ocean, fell into one vast and confused murmuring. A straining ear, however, caught a few words like these: "capitalistic," "monopolistic," "stonyhearted," "implacable," "the bitter end," "revenge." Those who knew the man put his mouthings and character together, and drew the conclusion — probably not far astray — that he was talking about fighting, and probably was advising that the sword be drawn, the bayonet be affixed, the cannon be loaded to the muzzle. This inference they drew the more readily from certain gestures which seemed to mean just those things, in one of which gestures, it may be added, he succeeded in sending Mr Dramatic's shining beaver hat spinning across the floor. It is idle to deny, however, the very patent fact that the words of Mr Pugnacious created a sensation, if not a consternation. But let us not marvel at that; it was the old Scotch woman who said of one of Dr Chalmer's sermons, that she "didna ken a word he said, but it was a' vera gran." But, as every dog must have his day, so every man must have his say; and Mr Pugnacious, having had his, sat down. The immediate after effect of his speech, however, was something other and greater than could possibly have been imagined or foretold. For, just as he sat down, the schoolhouse door, that had been closed lest an obtrusive ray of sunshine might catch the eyes of the members of the convention and beckon away their thoughts from the matter in hand, swung wide open with a reverberating bang, and in walked a bevy of women, some younger, some older, very modestly for the most part, and in some instances very somberly attired — in some cases very plainly, as though the world went hard with them. Well! This was an apparition indeed. For the pedagogues, for some reason which your historian knoweth not, had not invited a single one of the gentler sex to this unique convention. One can not but wonder, however, why so important an element in society and life had been so utterly ignored. Was it because the convention was an experiment, and any failure would be mercilessly scored by the concurrent and scornful laughter of the women? Was it for fear that they would usurp the places of the men in debate and rend the air with loud clamorings and contentions? Was it because the men really were, or felt themselves to be, the only creatures in the mundane part of the universe competent to settle the question of strike or no strike? Or was it because the men felt that, if heroic action must be taken on the resolutions, the women would fall to wailing and weeping, and, with feelings all sackcloth-and-ashes-like, would prophesy the utter homelessness and despair of the pedagogues, sans schoolhouses, sans pupils, sans brief authority they love to exercise — sans pay? I do not know, I can not tell. *But there they are.* It is now the duty of the historian to tell *who* they are. The knowing is easy, for many and unmistakable are the marks: they are schoolma'ams, or, if one better likes the word, pedagoguesses. Believe me, it was not long before this stag convention was thoroughly aware of the presence of a deer herd; for Miss Radical — as I afterward found her name to be — had scarcely bounded into her seat, before she bounded out and up and shouted to the chairman, whose name and nature she was alike ignorant of: "Mr Man, what means this stir in the schoolhouse — these strident voices that reach to the outer world — this solemn conclave of solemn suited men? Did they think, sir, that any change would be brought about in the educational world without calling for *our* aid? Or, is it true, as I shrewdly suspect, that this convention has been secretly summoned to devise ways and means for still further tightening their clutch on the best places and the biggest pay, relegating us poor women to the hardest work, the most meager fare and starvation wages?"

As she neared the end of this impassioned interrogation, her form rose higher and higher, her voice louder and louder, her face redder and redder, till the little schoolhouse was suffused with as red a radiance on its inner as its outer walls, while through the radiance swept great waves of sound, and throughout the whole room her dominating presence was most powerfully felt. Poor Pax, the chairman, seemed chained to his seat, or glued there, as by the mucilage or molasses of a schoolboy's cunning hand. But, with a desperate effort, he wrenched himself from his moorings, and, standing abashed and cowedly before the weird impersonation of radicalism, he humbly said: "Madame, I assure you, we meant no wrong. A few of us men folks thought we would get together in a quiet way and look over and talk over and smoke — I beg pardon, madame, no! *sleep* over the matter. I confess, madame, that I did not suspect that any such firebrand resolutions would be waved before our gaze. I —" "What resolutions, sir?" cried the towering radical, while she still held the floor, though it did seem as though the floor would scarcely hold her. "Will the secretary kindly read the resolutions?" murmured Professor Pax, and half dropped, half slid into his seat. Yes, he would and he did. Both the men and the women listened as for their lives. When the secretary had finished reading, there was a perfect silence for a full minute — a silence that was at length broken by the falling of a ferule which Professor Pax had evidently brushed off the desk as he rose to suggest that debate was still in order. And it was deliciously painful to hear the burden of trembling emphasis which he laid on the word *order*. It was clear to see that, not only did he regard order as "Heaven's first law," but as Earth's bounden duty in a pedagogic convention. 'T was surely a trying time for Pax. He evidently felt that a challenge of some vague and portentous sort had been thrown down by Miss Radical. And oh! who should pick up the cudgel? Who would get cudgeled?

But just then a tall, thin faced, thin habited, thin inhabited man rose up, and giving his name to the chairman as Mr Practical, spoke as follows: "I trust that the somewhat sudden and surprising advent of our sister teachers into our convention will not frighten us, nor disturb the harmony of our discussions. The truth is, Mr Chairman, that we are very greatly indebted to the women of this blessed land of ours for the education and care of the young. They have been untiring in the discharge of that sacred trust. Why, sir, how many of us who sit here today are indebted for our earliest glimpses of the broad and fertile fields of knowledge to some woman, who with a care and thoughtfulness akin to that of a mother watched over our youthful steps? Sir, I honor them. I am glad they came in among us. And I move, sir, that the privileges of debate and vote be extended to them."

At once a dozen men sprang to their feet to second this motion, and a flush of glad and conscious pride came into the face of Professor Pax. He put the question, and straightway a thundering chorus of "ayes" left no room to doubt that in *that* meeting the women were free to speak, and free to vote, as well. To the credit of the women be it said, they uttered no boastful cry over the victory they had won — simply smiled at each other in a knowing sort of a way, and settled back into their seats to hear further words of wisdom or folly, as the case might be, from the men. As soon as the chairman had announced that the resolutions of Mr Headstrong were still before the house for discussion, Braggadocio arose. He was seemingly one of the youngest men in the convention, and his name seemed to bespeak him of foreign birth or parentage. Not so, however, for it was soon whispered about that he was a full blooded young American; and men remarked on the strange coincidence between the name and the boastful character of the owner of the name. "Mr Chairman," he cried, "this is the most glorious country on which the sun ever shed a single ray of light; and, sir, the most glorious institution in this benign land of ours is the public school. I can truly say of it as the man said of the tree, 'In youth it sheltered me, and I'll protect it now'."

At this point an old Graybeard was heard to say to his neighbor that it was a mighty good thing that the public school didn't need much protection if it must rely on such help as that. Fortunately for Mr Braggadocio, he did not hear this remark, but, taking another turn in the screw of his rhetorical fancy, he went on to picture, in words whose brilliancy the historian can not possibly depict, the way in which he had brought order out of chaos, liberality out of trustees, thankfulness out of parents, genius out of small boys and girls, and the promise of an extra fifty cents a week if he would only abide and teach in the Surfacetown school for another year! And then Mr Braggadocio signified his willingness to answer any questions that might be asked concerning his methods. But, to his surprise, not a single question was asked. This left the historian pondering whether the audience felt that what the speaker had said was mere oily gammon, or that his was a genius that might do such miracles, but that that was a point beyond them, and that they, perforce, must travel on in the same old way.

The nonquestioning spirit of the audience seemed to have a bewildering and benumbing influence on our young friend and he soon abandoned the floor, just as old Graybeard's neighbor whispered to him, " Didn't he lose his head? " " Hadn't any to lose," quietly replied the Graybeard.

And now appeared on the floor a positive diversion in the person of Mr Peregrinator. Mr P. began by remarking that he had just dropped in to the convention that morning on his way from the neighboring town of Flopover, whither he had gone for the sake of securing a place as teacher. He said he had been attracted by the name of the town, Flopover, for in truth he had been a sort of " flopover " himself during all his pedagogic life. " Hardly a state in the Union, Mr Chairman, in which the sound of my pedagogic voice and the whack of my pedagogic ferule have not been heard. I have also cut birch and flogged pupils in several of the territories of the Far West. An experience, sir, so vast and varied as mine has been, gives me the right to speak in this assembly; and I desire to say right here and now, as the result of my cosmopolitan wanderings, that that teacher will be the happiest who moves the oftenest. (Much stir in the audience and a general picking up of ears) Why, sir, it's the new broom that sweeps clean, as we all have been told; and just so it's the new teacher who takes the fancy of the community, is invited to parties and sociables and picnics, gets a new bit of carpet to put under his desk, and perhaps a new desk to put on his carpet, has a new hinge put on the door, and a brand-new leg for the stove, thus restoring the mutilated fire box to its original quadrupedal form. But, sir, the popularity of a new face and a new form and voice will soon fade, and become as rusty as the old hinge and hook and stove leg. Ar, sir, 't is time that teacher was flitting 'Away! away!' the wise teacher says to himself. 'Fading, still fading, the last beam of my popularity is fading. 'Away to fresh fields and pedagogic pastures new.' As Mr Milton would say, The world is all before me where to choose, and Providence my guide." (Here the Graybeard whispered to his neighbor that he guessed Providence must be kept pretty busy chasing up and guiding Brother Peregrinator). "And so, Mr Chairman, I wish I could win over all my pedagogic brethren and sisters to this free and nomadic life of mine. But you tell me that trustees would often be left in the lurch by such sudden and summary leave-takings as would ensue from such a condition of things. Well, tell me, Mr Chairman"— Just here the chairman jumped from his seat and with more vigor that he had yet shown said: "I will tell you, Mr Peregrinator, that you are not sticking to the question before the house; that you now wander as widely in your talk as erstwhile with your pedagogic legs; that you must confine yourself to the question at issue, or at once resume your seat." Straightway the man thus accosted seized his hat and strode down the aisle in high dudgeon amid the applause of the assembly, cries of "Hurrah for Flopover," and a sharp rap, rap of the gavel of the once tame, now aroused Professor Pax.

When the noise had died away, Mr Logician gained the floor. 'T was time! He also said it was "time to look the question of striking squarely in the face — time to take the bearings of the course and see whither we are drifting. Let us look for a minute," said he, "at the logic of the situation. As I view it, it is this: 'T is not pleasant to be struck. But he who strikes may be struck. Therefore, to strike may be productive of unpleasantness. On the other hand, whoso cringes before a foe or a wrong is unmanly. The condition of things now existing in the pedagogic world is a wrong. Therefore, to cringe — that is, not to strike, would be unmanly. Really, gentlemen — I mean, ladies and gentlemen, the situation is growing embarrassing. As the old proverb puts it, we are 'between the Devil and the deep sea.' I can't swim, and therefore I must dodge the sea; and I am sure I do not care to be brought into close contact with Satan. I should be like the sick man who was told by his physician that he could do nothing more for him, but must leave him to wrestle with the Lord. 'Don't do it, Doctor,' cried the alarmed patient, 'why, he'd throw me in a minute.' So Satan would me. I think I'll wait for the logical outcome of this business." And down he sat.

Thus far in the discussion the speakers, in the main, had been men (and a woman) of most pronounced and positive views. And indeed the next speaker might be so termed — Mr Idealistic. In him, however, was this important modification, he looked at everything through the highly colored mirror of a strong but somewhat erratic imagination. Even his first sentence was startling: "Mr Chairman, for one I shall never be content with my treatment as a pedagogue till the various boards of education and trustees of the land give to each and every teacher in their employ a 40 weeks trip to Europe — expenses paid." ("Whew!" "whew!" from a dozen different parts of the room) "Why, sir, I trust that nobody will think that I desire this for myself or for others, simply for the sake of recreation. By no means, but rather that we may give such study and research to matters in the Old World that, when we come back to the New, we may never open our mouths before our pupils without enchanting them with the words, 'When I was in Europe,' followed by such a wealth of reminiscence, information, knowledge and idealism as will send their little brains home at night aching with the freightage of good received and stored away." (This sentence amused Graybeard very much, and, leaning over to his neighbor, he said, "Bet a dollar *he* never had a headache in *his* life.") "Mr Chairman, I move to insert in the resolutions as one ground of complaint that teachers are not sent to Europe at the expense of the communities they so faithfully serve." Immediately Graybeard jumped to his feet and cried: "Mr Chairman, I second the motion," in the same breath adding, "and I move to amend by inserting after the word Europe, the words, 'and to all the more noted jungles of Asia and deserts of Africa, and also to New Jersey'." At once Graybeard's neighbor seconded the motion as amended. Well, it was a study to watch Mr Idealistic trying to fathom the significance of the descent from the civilization of Europe to the savagery of Asia and Africa; for, though his imagination worked *upward* very finely, it was a flat failure *downward*.

But, if it was a study to watch Idealistic, 't was a whole course of studies to see the face of Professor Pax, for the struggle was excruciatingly interesting 'twixt his evident desire to preserve the dignity due to his exalted position as chairman and the well-nigh irrepressible desire to enjoy the fun which Graybeard had set on foot. Still, he managed to put the question on the Asiatic and Africanic amendment. It was carried through with a sweep and chorus of ayes, very flattering to Graybeard, very embarrassing to Idealistic; the original European motion, as amended, was then carried; and then, to cap and crown all, the same Graybeard moved that Mr Idealistic be required to make the Asiatic and Africanic trip at his own expense and report results at a special meeting of the convention to be held at Chicago at the world's fair in '92. This motion the convention seconded to a man, save Mr Idealistic; and it was thought that he was in favor of it, as he immediately grabbed his hat and fairly flew to the door and through it, as though speeding to catch the first flier for the Sahara desert.

When the wave of mirth which swept over the assembly had died away, and the chairman had put together his gravity, which had all gone to pieces in the recent parliamentary tomfoolery, Mr Dignity arose and began to berate the convention in no uncertain tone for its utter loss of self-respect, as he termed it. " Mr Chairman, we owe it to ourselves as pedagogues, to the community, nay to the world, here and now to set an example of dignity of manner and sobriety of mind befitting our profession." (Here Graybeard whispered to his neighbor that he reckoned the world didn't care very much if young Idealistic was sent away on a gale of laughter, so long as he got away.) " Sir," continued Mr Dignity, " let us get down from the high horse of this levity and mount the lowly hobby of the resolutions before us. There is one resolution in particular, namely that aimed at indignation, which I approve with all my heart and stomach. If boards of education and trustees and commissioners can do nothing for us, I feel constrained to say that I think perhaps we would better bolt." "What? your food?" cried a Mr Dramatic. "No," freezingly replied Mr Dignity, "our schoolhouses."

From dignity like this to despair was but a step, and Mr Despondency now took the floor. He was a man learned and practised in the philosophy of pessimism, and at once began most plaintively to whine about the decadence and disappearance of every genial thing the public school system had ever fondly thought to be its own. The pupils could not be trusted — he had himself caught one, lately, cheating in an examination. "Where, then, is the honor," he cried, "which Adam once knew and practised in Eden's garden? Was Adam ever known, sir, to cheat in an examination?" That question was a stumper, till one of the long-time silent contingent of women cried out, "No, but he cheated poor Eve about a pesky little apple"; and Mr Despondency resumed his seat in a hurry.

Here the historian must pause to note that wonderful provision in human nature which commonly leads each man to differ, in some way or other, from every other man. That provision came blessedly into play here, for no sooner had the disciple and advocate of pessimism reached his seat than up sprang Mr Hopeful; and, while he allowed that there was some ground for the complaints uttered in some of the resolutions, he was still of the mind that "behind the clouds was the sun still shining," that the good was more than the ill, on the whole, and that the improvement in school affairs he had seen in his brief day made his vision of the future very radiant. "Why," said Mr Hopeful, "I can remember the time when the precious minds of young folks were intrusted to the care, so called, of any upstart who took it into his or her head that he or she was born to teach. Born? — yes; to teach? never. But nowadays (at least 'tis so in the Empire State) the humblest schoolhouse has as its mistress, the poorest children as their friend, some woman who knows something and has been trained to teach. I can remember, too, when the teachers institute in this State had fallen to a very low ebb of interest and profit; today, young teachers have poured in on their receptive minds floods of knowledge from trained conductors, and from the best teaching talent our normal schools can supply. So, my cry is *Nil desperandum! Semper sperandum!* What we want in education today is workers — what we do not need, croakers."

This speech put the convention in a very pleasant frame of mind, and probably was the means of encouraging Mr Dramatic to rise and pull forth a manuscript from his pocket. Then, running his fingers through his hair and clearing his throat, he began: "Gentlemen of the convention, Pardon this detention, Giving me attention, And this brief invention, Take in good intention"—"Oh, horror!" whispered Graybeard to his neighbor, "he is going to read a poem and bring in every word in the English language that ends in tion." The neighbor's cheek grew blanchy. "It must not be," he said. "Head him off." "I'll do it or perish in the attempt. Mr Chairman," cried Graybeard, "I move that we adopt as our own the sentiments Mr Dramatic would have uttered if he had gone on to the end, and that he have leave to print them in the *Pedagogic Journal* at his own expense." Well, it was curious how often the house was with Graybeard in his audacious utterances and propositions. For this motion, like that which floored, or unfloored, Mr Peregrinator and Mr Idealistic, was adopted with a perfect shout of unanimity. Down went Mr Dramatic, and an unknown delegate, whose name the historian did not catch, moved that Mr Conservative and Mr Radical, each in a three minute speech, sum up the question, turn it over to the chairman for such brief remarks as he might wish to make, and that then the previous question be moved. Now the operation of the previous question, as all parliamentarians know, is to cut off all further discussion and to bring the main matter at once to vote. Whether all the men and women understood this, your chronicler does not know, but at any rate the motion was carried. Mr Indecision, who had intended to speak, was left stranded, and Mr Conservative slowly rose to speak. "There is an old Latin proverb, Mr Chairman, which says, 'Make haste slowly.' 'T is most applicable now. My friend Radical, whose sister loomed up to view a short time since in this convention, will probably say to you, 'Strike while the iron is hot.' Not so, sir, wait till the iron of our anger has cooled. Let us exhaust all peaceable means before we take the extreme step. Let us wait, sir! Brains will write good textbooks for us; sound psychology will bring us smaller classes; the common sense of communities will bring us better regulations and facilities for work, will bring us vindication of our toil and recognition; a little stiffening of our backbones will make us sufficiently independent in action to silence educational politicians and nullify wrong political influences; the pressure of daily work will lessen our examinations, and drive the bread-and-butter teachers out of our ranks; the exercise of a Joblike patience will cure parental foolishness; the exercise of an athlete will cure our dyspepsia; true charity will abate our anger and revenge; and Time will kill off the book agents. Again I say, sir, let us go slowly." Cheers, and anti-polyphonic cheers as Mr Radical rises. "Mr Chairman, are we never to hear the last of letting ill enough alone for fear of making it worse? I believe in going to the root of this matter. 'The existing order of things,' says Emerson, 'is the castle which conservatism is set to defend.' Does my friend Conservative like the existing order of things? Is *that* the tumble-down castle he wishes to defend? Indeed, I *do* say, sir, 'Strike while the iron is hot!' Strike while the ring of these resolutions is in our ears! Strike while the fair form of Liberty is before our eyes! Strike now! Strike hard! And, if at first we don't succeed, strike, strike again."

As soon as the applause which followed this striking speech had died away, Professor Pax arose, and, thanking the convention for the courtesy displayed toward him, began to compliment. He complimented those who had the courage to run away, and those who had the courage to stay; the logic of this one, the wit of that one, the rhetoric of the other one; the peroration of Mr Conservative; the ringing utterances of Mr Radical; in particular he complimented the ladies present, predicting that they would one day conquer the world as deftly as they had captured the convention. He then intimated that he had opinions on the subjects before the house, but declared he should abstain from expressing them, modestly adding that he was the mouthpiece, not the headpiece of the convention. He then said: "Ladies and gentlemen, the question is on the adoption of the resolution to strike, introduced by Mr Headstrong. Those in favor"—"Mr Chairman, Mr Chairman," cried Mr Impulse, "I move the substitution of the following:"

Resolved, That we pocket the resolutions of Mr Headstrong, carry them home, study them, and take action on them at some other time.

The motion was seconded, and, though the chairman had no parliamentary right to put the question, he did, and it was carried, 52 to 2, Mr Headstrong and Mr Radical alone dissenting. Then Mr Dramatic rushed to the platform and unfurled a flag with this legend, "Trustees, Commissioners, Communities, Pupils, Public school system! With all your faults, we love you still"; and Professor Pax declared the convention adjourned, to meet at the world's fair in 1892. Whether they thus met, or, if so, what action, if any, they took on the resolutions, no man or woman knoweth, or, if knowing — telleth.

Wednesday morning, December 31

President Fosdick — I am glad that the time has come when your present presiding officer is to join the ancient and honorable society of the "has-beens". It is one of the most famous fraternities in existence; and I shall no doubt take greater comfort and pleasure in my affiliation with it than I have in being connected with the more active duties of this association. I wish to express to the members of the Associated Academic Principals my heartfelt appreciation for the cordial support which you have given me. I came into this office in a somewhat peculiar way. In fact, I was told that there was a "cloud on my title"; but, notwithstanding this, the cooperation and assistance which I have received at your hands have been of a character which I shall always remember with feelings of gratitude and joy. I wish particularly to call attention to the indefatigable and helpful work of the secretary, without whose aid this meeting would not have been the success which it has been.

Superintendent Armstrong, it gives me great pleasure to welcome you to the platform and formally place the duties of office on your shoulders. I can not give you a gavel, because I have none; but, on behalf of the Associated Academic Principals, I give you a good hearty hand-shake, which expresses the confidence we have in you as a man and educator.

President-elect Armstrong — I trust, sir, that when my time shall come to be placed among the "has-beens," I may feel that my work has been as well done as yours has been. However dark the clouds may have been under which you entered this office, the academic principals who have listened to this program can assure you that you are going out in a glow of sunshine. The meeting has been one of unusual interest and pleasure. The arrangement and plan have been such that it has been very gratifying to all who have attended. My thanks are due to you, sir, for your kindness to me at this time and for the kind words which you have said. And to you, gentlemen and ladies of the Academic Principals Association, I feel very grateful. To be your president is an honor that I appreciate, I think I can safely say, more than any other that could be conferred on me. I have been a member of this association for something like 12 years, and during that time I have looked forward to the meetings with the greatest anticipation because I appreciate the warm grasp of the hand of my fellow teachers, and I go home with an inspiration because of the good thoughts that I get here. Because of the encouragement which we receive from these meetings, it shall be my aim, in entering on the duties of this office, to try as best I can to fulfil the responsibility in as creditable a manner as my predecessor and the distinguished line of predecessors have done. I feel this honor specially because I have come home to have it conferred on me. This is my home city, if I have any home city. I was born but a few miles from here. In this city, I received my first third grade license to teach, and I attended here the first teachers association that I ever attended in my life. I attended the first institute here. I was a member of the first principals council in this city. You can thus understand why I feel that you have honored me in a manner which is particularly gratifying. If hard work, if effort, if a receptive mind toward your advice and your council will make this association a success, we shall have a successful meeting next year. I trust that I shall have your support in making the coming meeting a successful one. Again I thank you most heartily.

ATTENDANTS AT

18th Annual Conference of the Associated Academic Principals

Under names of institutions those not specially designated are teachers and instructors.

UNIVERSITY OF THE STATE OF NEW YORK

Regents

1 [a]Charles R. Skinner M.A. LL.D.

University staff

College and High School Department. 2 Henry L. Taylor M.A. Ph.D. *director's assistant*

Inspection division. 3 Charles F. Wheelock B.S. *head inspector;* 4 Charles N. Cobb M.A.; 5 Charles Davidson M.A. Ph.D.; 6 Eugene W. Lyttle M.A. Ph.D.; 7 S. Dwight Arms M.A.; 8 Ezra J. Peck M.A. LL.D.; 9 E. S. Frisbee M.A. D.D.; 10 I. O. Crissy, *inspector business education;* 11 James H. Gibson, *apparatus inspector;* 12 Frederic M. Baker, *apparatus clerk*

DEPARTMENT OF PUBLIC INSTRUCTION

Charles R. Skinner M.A. LL.D. *superintendent;* 13 A. M. Wright M.A. *second deputy sup't;* 14 I. H. Stout, *supervisor of institutes;* 15 Sherman Williams Pd.D., 16 P. M. Hull M.A., 17 Charles A. Shaver, *institute conductors;* 18 Frank H. Wood M.A. *supervisor of training classes;* 19 John C. Bliss B.A. *inspector of training classes;* 20 A. E. Hall, 21 John J. N. Symes, *inspectors, compulsory attendance*

INSTITUTIONS IN THE UNIVERSITY

Colleges for men

Hamilton College, Clinton. 22 Pres. M. Woolsey Stryker; 23 Prof. Henry White

Niagara University. 24 Prof. P. J. Conroy C.M.

Polytechnic Institute of Brooklyn. 25 Prof. Brainard Kellogg

St John's College, Brooklyn. 26 Rev. E. L. Carey, *secretary*

Union University. 27 Prof. B. H. Ripton, *dean;* 28 Prof. Frank B. Williams

Colleges for men and women

Alfred University. 29 Prof. Edward M. Tomlinson

Cornell University, Ithaca. 30 Prof. Charles De Garmo

Keuka College. 31 Pres. George H. Ball

University of Rochester. 32 Pres. Rush Rhees

---

[a] *See also* Department of Public Instruction.

Schools of education

State Normal College, Albany. 33 Pres. William J. **Milne** LL.D.; 34 Prof. George G. Groat

Other special schools

New York State School of Clay-working and Ceramics, Alfred University. 35 Charles F. Binns, *director*

Academies, High Schools and Academic Departments

Adams High School. 36 Prin. R. H. Snyder

Addison High School. 37 Prin. F. K. Congdon

Albany High School. 38 Com'r H. P. French

Albion High School. 39 Sup't & Prin. Willis G. Carmer; 40 Everett K. Van Allen; 41 Cora V. Luttenton

Alden High School. 42 Prin. B. X. Shields

Alexandria Bay High School. 43 Prin. H. B. Jones

Alfred Academy. 44 Prin. Earl P. Saunders

Allegany High School. 45 Prin. A. P. Burroughs

Altamont Union School. 46 Prin. Arthur Z. Boothby

Altmar Union School. 47 Prin. Alfred S. Bassette

Amsterdam High School. 48 Sup't H. T. Morrow; 49 Prin. Wilbur H. Lynch

Andes High School. 50 Prin. M. C. Smith

Andover High School. 51 Prin. E. M. Morse

Angelica Academy. 52 Prin. Charles W. Vandegrift

Angola High School. 53 Prin. C. S. Palmer

Antwerp High School. 54 Prin. E. C. Hocmer

Argyle High School. 55 Prin. E. M. Sanford

Attica High School. 56 Prin. Arthur M. Preston

Avoca High School. 57 Prin. W. B. Patrick

Babylon High School. 58 Prin. W. H. Lisk

Bainbridge High School. 59 Prin. F. W. Crumb

Baldwinsville Free Academy. 60 Prin. Horace D. Rickard

Ballston Spa High School. 61 A. A. Lavery, ***supervising prin.***

Barlow School of Industrial Arts, Binghamton. 62 Prin. V. S. Paessler

Batavia High School. 63 Sup't John Kennedy

Bay Shore High School. 64 Prin. Charles W. Mulford

Binghamton High School. 65 Prin. J. Edward Banta

Black River Union School. 66 Prin. Alvin E. House

Boonville High School. 67 Prin. Neil K. White

Brasher and Stockholm High School, Brasher **Falls.** 68 Prin. A. J. Fields

Bridgewater High School. 69 Prin. Alson A. Upham

Brocton High School. 70 Prin. C. W. Whitney

Brownville Union School. 71 Prin. W. J. Linnell

Brushton High School. 72 Prin. Frank H. Wallace
Caledonia High School. 73 Prin. Fayette W. Van Zile
Cambridge High School. 74 Prin. F. J. Bohlmann
Camillus Union School. 75 Prin. C. S. Boatfield
Canajoharie High School. 76 Prin. Ernest E. Smith
Canandaigua Academy. 77 Sup't and Prin. J. C. Norris
Canaseraga Union School. 78 Prin. Leon Grady
Canastota High School. 79 Prin. George H. Ottaway
Canisteo High School. 80 Prin. Frank F. Dunham
Canton High School. 81 Prin. C. L. Mosher
Castile High School. 82 Prin. H. P. Weatherlow
Castleton Union School. 83 Prin. W. H. Waterbury
Cattaraugus High School. 84 Prin. Burtis E. Whittaker; 85 Vice Prin. I. J. McGinity
Cazenovia Seminary. 86 Pres. F. D. Blakeslee; 87 E. F. Cuykendall
Central Square Union School. 88 Prin. Homer T. Wilmot
Charlotte High School. 89 Prin. Herbert G. Reed
Chatham High School. 90 Prin. Charles S. Williams
Cherry Creek High School. 91 Prin. John M. Crofoot
Christian Brothers Academy, Albany. 92 Brother Maurice, *prin.*; 93 Brother Jasper, *vice prin.*
Churchville High School. 94 Prin. Nicholas Lee
Clayton High School. 95 Prin. Ernest Robinson
Cleveland Union School. 96 Prin. Wesley J. Somers
Clifton Springs High School. 97 N. L. Lobdell
Clinton High School. 98 Prin. Percy L. Wight; 99 Ass't Prin. D. W. Redmond
Clyde High School. 100 Prin. H. N. Tolman
Coeymans High School. 101 Prin. R. A. Mabie
Colgate Academy, Hamilton. 102 Prin. Frank L. Shepardson
Collins Center Union School. 103 Prin. Harold J. Russell
Constableville Union School. 104 Prin. H. G. Grubel
Corinth High School. 105 Prin. A. M. Hollister
Cornwall High School. 106 Prin. Herman C. Woodworth
Cornwall-on-Hudson High School. 107 Prin. F. C. White
Cortland Union School. 108 Sup't & Prin. F. E. Smith
Coxsackie High School. 109 Prin. George W. Fairgrieve
Crown Point Union School. 110 Prin.. E. M. Sanders
Cuba High School. 111 Prin. William D. Hewes
Dansville High School. 112 Prin. E. J. Bonner
De Kalb Junction Union School. 113 Prin. Lewis H. Mott
Delaware Academy and Union School, Delhi. 114 Prin. Olin Wilson Wood
Depew Union School. 115 Prin. H. C. Hustleby
Deposit High School. 116 Prin. W. L. Harris

De Ruyter High School. 117 Prin. Emmett C. Miller

Dexter High School. 118 Prin. Burt Alverson

Dolgeville High School. 119 Prin. James Eggenberger

Dryden High School. 120 Prin. Frederick P. Webster

Dundee High School. 121 Prin. D. B. Smith

East Aurora High School. 122 Prin. George N. Wiley

East Bloomfield High School. 123 Prin. Frederick Bird Jones

East Pembroke Union School. 124 Prin. H. William Dyer

East Rockaway Union School. 125 Prin. C. D. Vosburgh

East Syracuse High School. 126 Prin. F. H. Brown

Eaton Union School. 127 Prin. Roy B. Kelley

Edwards Union School. 128 Prin. Grover C. Hosford

Egberts High School, Cohoes. 129 Prin. W. C. Tifft

Ellenville High School. 130 Prin. J. W. Chandler

Ellington High School. 131 Prin. Ernest B. Luce

Elmira Free Academy. 132 Prin. Howard Conant

Elmsford Union School. 133 Prin. Frank D. Simons

Erasmus Hall High School, Brooklyn. 134 Prin. W. B. Gunnison

Fabius High School. 135 Prin. W. S. Austin

Fairport High School. 136 Prin. T. C. Wilber

Falconer Union School. 137 Prin. Ross Jewell

Fayetteville High School. 138 Prin. D. B. Williams

Fishkill-on-Hudson High School. 139 Prin. W. J. Millar

Flushing High School. 140 Prin. John Holley Clark

Fonda High School. 141 Prin. E. B. Robbins

Forestport Union School. 142 Prin. W. G. Cruikshank

Forestville Free Academy. 143 Prin. A. C. Anderson

Fort Edward High School. 144 Prin. W. S. Coleman

Frankfort High School. 145 Prin. F. J. Medden

Franklin Academy, Malone. 146 Prin. L. F. Hodge

Franklin Academy and Prattsburg High School, Prattsburg. 147 Prin. Jared M. Scoville

Fraser Union School, Hastings-upon-Hudson. 148 Prin. W. R. Williams

Freeport High School. 149 Prin. E. F. McKinley

Freeville Union School. 150 Prin. B. B. Chappell

Friendship High School. 151 Prin. W. W. Miller

Gainesville Union School. 152 Prin. Joseph P. Behm

Genesee Wesleyan Seminary, Lima. 153 Pres. B. W. Hutchinson

Geneva High School. 154 Sup't & Prin. W. H. Truesdale

Glens Falls Academy. 155 Prin. Albert Sewall Cox; 156 D. C. Farr

Gloversville High School. 157 Sup't James A. Estee; 158 Prin. Abraham R. Brubacher

Goshen High School. 159 Prin. Guy Halsey Baskerville

Gouverneur High School. 160 Prin. H. De W. De Groat

Gowanda High School. 161 Prin. Robert W. Hughes

Granville High School. 162 Prin. R. E. Brown

Great Neck High School. 163 Prin. Fred J. Bierce
Greenwich High School. 164 Prin. C. L. Morey
Griffith Institute and Union School, Springville. 165 Prin. George A. Bolles
Hamilton High School. 166 Prin. George L. Bennett
Hammondsport High School. 167 Prin. Myron C. Plough
Hancock High School. 168 Prin. C. V. Bookhout
Hannibal Union School. 169 Prin. S. R. Lockwood
Harrisville Union School. 170 Prin. W. L. Avery
Hebrew Free School, Syracuse. 171 Prin. Max Switton
Hempstead High School. 172 Prin. Ezra Fred Knapp
Herkimer High School. 173 Sup't & Prin. Schuyler F. Herron
Hilton High School. 174 Prin. W. R. True
Hobart High School. 175 Prin. E. J. Graham
Holland Patent Union School. 176 Prin. D. Howard Naylor
Holley High School. 177 Prin. H. D. Bartlett
Homer Academy and Union School. 178 Prin. L. H. Tuthill
Honeoye Falls High School. 179 Prin. W. G. Clarke
Hoosick Falls High School. 180 Sup't & Prin. H. H. Snell
Hornellsville High School. 181 Sup't & Prin. Elmer S. Redman
Horseheads High School. 182 Prin. John P. Mabon
Huntington High School. 183 Prin. A. E. Chase
Irondequoit Union School. 184 Prin. Roscoe P. Conkling
Irvington High School. 185 Prin. R. A. MacDonald
Islip High School. 186 Prin. M. I. Hunt
Ithaca High School. 187 Sup't & Prin. F. D. Boynton; 188 Vice Prin. E. E. Bogart
Jamesville High School. 189 Prin. Wallace W. Rayfield
Jordan Free Academy. 190 Prin. R. B. Searle
Kinderhook Union School. 191 Prin. Scott Youmans
La Fayette Union School. 192 Prin. W. L. West
Lake George Union School, Caldwell. 193 Prin. James A. Barkley
Lake Placid High School. 194 Prin. W. Almon Andrews
Lawrence High School. 195 Prin. Fred DeL. King
Leavenworth Institute and Wolcott High School, Wolcott. 196 Prin. L. H. Carris
Le Roy High School. 197 Prin. J. C. Benedict
Lestershire Union School. 198 Prin. E. T. Graves
Limestone Union School. 199 Prin. P. J. McEvoy
Lisle Union School. 200 Prin. E. A. Stuart
Little Falls High School. 201 Sup't & Prin. C. H. Warfield
Little Valley High School. 202 Prin. A. C. Miller
Livonia High School. 203 Prin. Chester G. Sanford
Lockport High School. 204 Sup't Emmet Belknap; 205 Prin. Oliver J. Morelock
Longlake Union School. 206 Prin. John C. Malloch

Luzerne High School. 207 Prin. Christopher Keller

Lyons High School. 208 Prin. W. H. Kinney

Lyons Falls Union School. 209 Prin. S. J. Neff

Machias Union School. 210 Prin. E. Wesley Taylor

McLean Union School. 211 Prin. Charles H. Deane

Manchester Union School. 212 Prin. Charles H. Herrick

Maplehurst Union School, Hinsdale. 213 Prin. Fred S. Dunham

Marathon Union School. 214 Prin. P. M. Helfer

Masten Park High School, Buffalo. 215 Prin. Frank S. Fosdick

Matteawan High School. 216 Prin. Earlman Fenner

Mayville High School. 217 Prin. D. B. Albert

Medina High School. 218 Sup't & Prin. T. H. Armstrong; 219 Vice Prin. Ralph Mosher; 220 Edith Hill

Mexico Academy and High School. 221 Prin. A. H. Norton

Middleburg High School. 222 Prin. S. C. Kimm

Middleport High School. 223 Prin. Edwin M. Randolph

Middleville Union School. 224 Prin. Ira M. Gast

Millbrook Memorial School. 225 Prin. William R. Anderson

Mineville High School. 226 Prin. S. D. McClellan

Monroe Union School. 227 Prin. Orville Eichenberg

Monticello High School. 228 Prin. A. J. Glennie

Moravia High School. 229 Prin. John D. Bigelow

Morristown Union School. 230 Prin. Jervis B. Lawrence

Morrisville High School. 231 Prin. Clayton G. Mabey

Mt Kisco High School. 232 Prin. Phil H. Hembdt

Mt Morris High School. 233 Prin. Luther Norton Steele

Mumford Union School. 234 Prin. Eugene M. Lath

Munnsville Union School. 235 Prin. Edson A. Fuller

New Berlin High School. 236 Prin. Arthur R. Mason

New Hartford High School. 237 Prin. A. M. Scripture

New York State School for the Blind, Batavia. 238 Sup't & Prin. Olin Howard Burritt

New York Mills Union School No. 2. 239 Prin. Ray P. Snyder

Newark High School. 240 Prin. C. A. Hamilton

Newark Valley High School. 241 Prin. J. Stanton Kingsley

Newport High School. 242 Prin. A. H. Hollister

Niagara Falls High School. 243 Prin. Thomas Bailey Lovell

Nichols Union School. 244 Prin. Frank E. Fenno

North Brookfield Union School. 245 Prin. John Hart

North Collins High School. 246 Prin. William B. Blaisdell

North Tarrytown Union School. 247 Prin. Lewis W. Craig

North Tonawanda High School. 248 Sup't Frank J. Beardsley; 249 Prin. Herbert S. Weet

Northside High School, Corning. 250 Prin. A. M. Blodgett

Norwich High School. 251 Sup't S. J. Gibson; 252 Prin. R. C. Van Ingen

Norwood High School. 253 Prin. C. A. Fetterly

Nunda High School. 254 Prin. E. E. McDowell

Ogdensburg Free Academy. 255 Prin. Fred Van Duzen

Olean High School. 256 Prin. W. S. Steele

Oneida High School. 257 Sup't A. W. Skinner; 258 Prin. C. Ernest Brown

Oneonta High School. 259 Prin. R. S. Roulston

Onondaga Free Academy, Onondaga Valley. 260 Prin. Guy A. Bailey

Ontario High School. 261 Prin. H. S. G. Loveless

Orient Union School. 262 Prin. R. Thurston Le Valley

Oriskany Falls Union School. 263 Prin. F. Reid Spaulding

Ossining High School. 264 Prin. Ida W. Bennett

Oswego High School. 265 Prin. C. W. Richards

Otego Union School. 266 Prin. Harvey C. Hayes

Owego Free Academy, 267 Sup't H. B. Tilbury; 268 Prin. H. L. Russell

Oxford Academy and Union School. 269 Prin. Robert K. Toaz

Oyster Bay High School. 270 Prin. B. Frank Cooley

Painted Post Union School. 271 Prin. B. E. Hicks

Palatine Bridge High School. 272 Prin. Randolph T. Congdon

Palmer Institute — Starkey Seminary, Lakemont. 273 Pres. Martyn Summerbell; 274 Prin. F. G. Miller

Palmyra Classical High School. 275 Prin. W. J. Deans

Parishville Union School. 276 Prin. Lawrence S. Coit

Patterson Union School. 277 Prin. B. Frank Whitford

Pawling Union School. 278 Prin. Henry F. Blessing

Penn Yan Academy. 279 Sup't J. M. Thompson; 280 Prin. E. W. Cutler

Perry High School. 281 Prin. M. J. Multer

Phelps Union and Classical School. 282 Prin. Willis Arnold Ingalls

Pompey Union School. 283 Prin. H. D. Hutchinson

Port Byron High School. 284 Prin. Edson L. Moore

Port Henry High School. 285 Prin. P. F. Burke

Port Washington Union School. 286 Prin. Palmer J. Jones

Poughkeepsie High School. 287 Prin. C. H. Woolsey

Pulaski Academy and Union School. 288 Prin. Charles M. Bean

Ravena Union School. 289 Prin. B. I. Morey

Red Creek Union Seminary. 290 Prin. W. A. Ward

Red Hook Union School. 291 Prin. D. C. Lehman

Remsen High School. 292 Prin. H. G. Berry

Rensselaer High School. 293 Sup't W. H. Good; 294 Prin. Louis F. Robins

Rhinebeck High School. 295 Prin. W. B. Kelsey

Richfield Springs High School. 296 Prin. Albert H. Watkins

Ripley High School. 297 Prin. Hiram J. Baldwin

Rochester High School. 298 Prin. Albert H. Wilcox; 299 Frederick H. Abell; 300 Ernest R. Clark

Rome Free Academy. 301 Sup't Lewis N. Crane

Roscoe Union School. 302 Prin. A. E. Kent

Round Lake Union School. 303 Prin. J. W. Root

Rushville Union School. 304 Prin. Charles J. Smith

S. S. Seward Institute, Florida. 305 Prin. G. C. Schaible

Sacket Union School, Sacketts Harbor. 306 Prin. B. G. Pooler

St Johnsville High School. 307 Prin. C. G. Campbell

St Joseph's Academy, Albany. 308 Brother William, *prin.*

Salamanca High School. 309 Prin. Thomas Stone Bell

Sandy Creek High School. 310 Prin. George E. Brownell

Saratoga Springs High School. 311 Prin. G. W. Kennedy

Saugerties High School. 312 Prin. Fred N. Moulton

Savannah High School. 313 Prin. E. G. Merritt

Schoharie High School. 314 Prin. Robert V. Spencer

Schroon Lake Union School. 315 Prin. M. E. Janes

Schuylerville High School. 316 Prin. M. B. Hillegas

Scottsville Union School. 317 Prin. Burr Gould Eells

Sharon Springs Union School. 318 Prin. J. H. Crain

Shortsville High School. 319 Prin. J. F. Bullock

Silver Creek High School. 320 Prin. Edwin J. Howe

Sinclairville High School. 321 Prin. C. F. Walter

Sloan Union School. 322 Prin. Lawrence P. Button

Sodus Union School. 323 Prin. E. Curtiss

Solvay High School. 324 Prin. C. O. Richards

South Byron Union School. 325 Prin. H. F. Brooks

South Glens Falls High School. 326 Prin. W. J. Greene

South New Berlin Union School. 327 Prin. Jay D. Lester

South Side High School, Rockville Center. 328 Prin. L. W. Hoffman

Southampton High School. 329 Prin. J. G. Peck

Southold Union School. 330 Prin. William M. Wood

Spencerport Union School. 331 Prin. John Edmond Dubois

Spring Valley High School. 332 Prin. John M. Gibbs

Stamford Seminary and Union School. 333 Prin. Charles R. Clark

Stillwater Union School. 334 Prin. Henry J. Gibson

Stony Point High School. 335 Prin. George D. Sykes

Syracuse High School. 336 Prin. William K. Wickes

Tappan Zee High School, Piermont. 337 Prin. Leon J. Cook

Theresa High School. 338 Prin. C. H. Bulson

Ticonderoga High School. 339 Prin. Fred V. Lester

Tioga Center Union School. 340 Prin. M. A. Matteson

Tivoli Union School. 341 Prin. Charles W. Townsend

Tonawanda High School. 342 Sup't F. J. Diamond; 343 Prin. Henry Wheaton

Troy Academy. 344 Prin. J. G. Murdoch

Troy High School. 345 Prin. M. H. Walrath

Trumansburg High School. 346 Prin. F. M. Westfall

Turin Union School. 347 Prin. V. K. Barker

Union Union School. 348 Prin. J. L. Lusk

Union Springs High School. 349 Prin. Jesse C. Bell

Utica Free Academy. 350 Sup't George Griffith

Valatie High School. 351 Prin. W. L. Millias

Van Etten Union School. 352 Prin. Norman C. Gile

Verona Union School. 353 Prin. Albert T. Bouck

Walton High School. 354 Prin. J. R. Fairgrieve

Walworth Academy. 355 Prin. Carrol A. Mider

Warner Union School. 356 Prin. Theodore M. Gottry

Warrensburg High School. 357 Prin. Ezra W. Benedict

Warsaw High School. 358 Prin. George W. Glasier

Warwick Institute. 359 Prin. H. V. Rulison

Washington Academy, Salem. 360 Prin. A. B. Vossler

Watervliet High School. 361 Prin. J. A. Ayers

Watkins High School. 362 Prin. Samuel S. Johnson; 363 Vice Prin. John A. Beers

Waverly High School. 364 Prin. H. J. Walter

Waverly Union School of Tuckahoe. 365 Prin. Arthur C. Haff

Webster High School. 366 Prin. E. E. Collister

Wellsville High School. 367 Prin. Samuel J. Slawson; 368 H. H. Gage, *principal's associate*

Westport High School. 369 Prin. Edgar Wiley Ames

Williamsville High School. 370 Prin. W. G. Welker

Willsborough High School. 371 Prin. B. L. Haydon

Wilson High School. 372 Prin. Charles C. Scheck

Windsor High School. 373 Prin. Andrew J. MacElroy

Woodhull Union School. 374 Prin. Olin C. Hotchkiss

Yates High School, Chittenango. 375 Prin. William M. Fort

Yonkers High School. 376 Prin. William A. Edwards

Special registered schools

Utica Preparatory School. 377 Prin. William S. Rix

Business schools

Eastman, Poughkeepsie. 378 Pres. C. C. Gaines

OUTSIDE THE UNIVERSITY

Colleges for men and women

University of Chicago. 445 George H. Locke

Normal schools

Brockport. 379 Prin. C. T. McFarlane; 380 Prof. Lambert L. Jackson; 381 Jane E. Lowery; 382 Charles D. Seely

Buffalo. 383 Prin. James M. Cassety; 384 Mark M. Maycock; 385 A. C. Richardson

Cortland. 386 Prin. Francis J. Cheney

Geneseo. 387 Prin. John M. Milne

Jamaica. 388 Prin. A. C. McLachlan; 389 Roland S. Keyser

New York Training School for Teachers. 390 Prin. Augustus S. Downing; 391 Welland Hendrick

Oneonta. 392 Prin. Percy I. Bugbee; 393 Frank D. Blodgett; 394 Arthur M. Curtis

Potsdam. 395 Prin. T. B. Stowell

Academies, high schools and academic departments

Greenwich Ct. 396 Sup't James Winne

Newark (N. J.) High School. 397 William Leverette Morgan; 398 E. W. Murray

Elementary schools

Albion School. 399 Homer W. Luttenton

Cicero Center School. 400 Floyd H. Case

Lee Center Free School. 401 Walter C. Crouch

Niagara Falls Public School. 402 Prin. W. B. Chriswell

South Salem School. 403 Prin. Robert S. Welch

Stratford School. 404 Bessie C. Livingston

West Carthage Union Free School. 405 Prin. H. C. Gouldin

School commissioners

Cayuga county, 2d district. 406 George W. Atwater

Madison county, 1st district. 407 Carlos J. Coleman

Franklinville. 408 Christina McLennan

North Hector. 409 Frank L. Miller

Yates county. 410 N. Winton Palmer

Not officially connected with educational institutions

411 J. S. Adams, Ginn & Co.
412 Norman Bardeen, Syracuse
413 Frank D. Beattys, New York
414 C. W. Blessing, Globe School Book Co.
415 Herbert W. Briggs, Charles Scribner's Sons
416 W. A. Choate, Albany
417 Halsey M. Collins, Maynard, Merrill & Co.
418 O. P. Conant, Ginn & Co.
419 Jesse A. Ellsworth, Macmillan Co.
420 George Fenton, Broadalbin
421 George C. Field, University Publishing Co.
422 H. I. Ford, Ginn & Co.
423 Harry E. Glen, New York
424 J. A. Greene, American Book Co.

425 L. E. Gunnison, Silver, Burdett & Co.
426 A. L. Hart, New York
427 Charles D. Hill, Oswego Falls
428 Hazel Hill, Medina
429 F. C. Hodgdon, Ginn & Co.
430 William H. Ives, Macmillan Co.
431 Charles Ernst Keck, D. Appleton & Co.
432 W. D. Kerr, Fisk Teachers Agency
433 Edmond H. Lomber, Clinton
434 F. O. Merrill, New York
435 Allen Peckham, Silver, Burdett & Co.
436 P. A. Ray, D. C. Heath & Co.
437 Allen B. Rider, King-Richardson Co.
438 John C. Rockwell, Schermerhorn Teachers Agency
439 L. E. Rowley, American Book Co.
440 George H. Shattuck, Medina
441 Huse T. Skerritt, Waterloo
442 Clifford Stark, American Book Co.
443 H. E. Vincent, Buffalo
444 Charles H. Wilson, Albany

445 [*See* Colleges for men and women, p. 441]

ALPHABETIC INDEX

Numbers refer to preceding classed list.

Abell, F. H. 299
Adams, J. S. 411
Albert, D. B. 217
Alverson, Burt 118
Ames, E. W. 369
Anderson, A. C. 143
Anderson, W. R. 225
Andrews, W. A. 194
Arms, S. D. 7
Armstrong, T. H. 218
Atwater, G. W. 406
Austin, W. S. 135
Avery, W. L. 170
Ayers, J. A. 361

Bailey, G. A. 260
Baker, F. M. 12
Baldwin, H. J. 297
Ball, G. H. 31
Banta, J. E. 65
Bardeen, Norman 412
Barker, V. K. 347
Barkley, J. A. 193
Bartlett, H. D. 177
Baskerville, G. H. 158
Bassette, A. S. 47
Bean, C. M. 288
Beardsley, F. J. 248
Beattys, F. D. 413
Beers, J. A. 363
Behm, J. P. 152
Belknap, Emmet 204
Bell, J. C. 349
Bell, T. S. 309
Benedict, E. W. 357
Benedict, J. C. 197
Bennett, G. L. 166
Bennett, I. W. 264
Berry, H. G. 292
Bierce, F. J. 163
Bigelow, J. D. 229
Binns, C. F. 35
Blaisdell, W. B. 246
Blakeslee, F. D. 86
Blessing, C. W. 414
Blessing, H. F. 278
Bliss, J. C. 19
Blodgett, A. M. 250
Blodgett, F. D. 393
Boatfield, C. S. 75
Bogart, E. E. 188
Bohlmann, F. J. 74
Bolles, G. A. 165
Bonner, E. J. 112
Bookhout, C. V. 168
Boothby, A. Z. 46
Bouck, A. T. 353
Boynton, F. D. 187
Briggs, H. W. 415
Brooks, H. F. 325
Brown, C. E. 258
Brown, F. H. 126
Brown, R. E. 162
Brownell, G. E. 310
Brubacher, A. R. 158
Bugbee, P. I. 392
Bullock, J. F. 319
Bulson, C. H. 338
Burke, P. F. 285
Burritt, O. H. 238
Burroughs, A. P. 45
Button, L. P. 322

Campbell, C. G. 307
Carey, E. L. 26
Carmer, W. G. 39
Carris, L. H. 196
Case, F. H. 400
Cassety, J. M. 383
Chandler, J. W. 130
Chappell, B. B. 150
Chase, A. E. 183
Cheney, F. J. 386
Choate, W. A. 416
Chriswell, W. B. 402
Clark, C. R. 333
Clark, E. R. 300
Clark, J. H. 140
Clarke, W. G. 179
Cobb, C. N. 4
Coit, L. S. 276
Coleman, C. J. 407

Coleman, W. S. 144
Collins, H. M. 417
Collister, E. E. 366
Conant, Howard 132
Conant, O. P. 418
Congdon, F. K. 37
Congdon, R. T. 272
Conkling, R. P. 184
Conroy, P. J. 24
Cook, L. J. 337
Cooley, B. F. 270
Cox, A. S. 155
Craig, L. W. 247
Crain, J. H. 318
Crane, L. N. 301
Crissy, I. O. 10
Crofoot, J. M. 91
Crouch, W. C. 401
Cruikshank, W. G. 142
Crumb, F. W. 59
Curtis, A. M. 394
Curtiss, Elisha 323
Cutler, E. W. 280
Cuykendall, E. F. 87

Davidson, Charles 5
Deane, C. H. 211
Deans, W. J. 275
DeGarmo, Charles 30
DeGroat, H. D. 160
Diamond, F. J. 342
Downing, A. S. 390
DuBois, J. E. 331
Dunham, F. F. 80
Dunham, F. S. 213
Dyer, H. W. 124

Edwards, W. A. 376
Eells, B. G. 317
Eggenberger, James 119
Eichenberg, Orville 227
Ellsworth, J. A. 419
Estee, J. A. 157

Fairgrieve, G. W. 109
Fairgrieve, J. R. 354
Farr, D. C. 156
Fenner, Earlman 216
Fenno, F. E. 244
Fenton, George 420
Fetterly, C. A. 253
Field, G. C. 421
Fields, A. J. 68
Ford, H. I. 422
Fort, W. M. 375
Fosdick, F. S. 215
French, H. P. 38
Frisbee, E. S. 9
Fuller, E. A. 235

Gage, H. H. 368
Gaines, C. C. 378
Gast, I. M. 224
Gibbs, J. M. 332
Gibson, H. J. 334
Gibson, J. H. 11
Gibson, S. J. 251
Gile, N. C. 352
Glasier, G. W. 358
Glen, H. E. 423
Glennie, A. J. 228
Good, W. H. 293
Gottry, T. M. 356
Gouldin, H. C. 405
Grady, Leon 78
Graham, E. J. 175
Graves, E. T. 198
Greene, J. A. 424
Greene, W. J. 326
Griffith, George 350
Groat, G. G. 34
Grubel, H. G. 104
Gunnison, L. E. 425
Gunnison, W. B. 134

Haff, A. C. 365
Hall, A. E. 20
Hamilton, C. A. 240
Harris, W. L. 116
Hart, A. L. 426
Hart, John 245
Haydon, B. L. 371
Hayes, H. C. 266
Helfer, P. M. 214
Hembdt, P. H. 232
Hendrick, Welland 391
Herrick, C. H. 212
Herron, S. F. 173
Hewes, W. D. 111
Hicks, B. E. 271

Hill, C. D. 427
Hill, Edith 220
Hill, Hazel 428
Hillegas, M. B. 316
Hocmer, E. C. 54
Hodgdon, F. C. 429
Hodge, L. F. 146
Hoffman, L. W. 328
Hollister, A. H. 242
Hollister, A. M. 105
Hosford, G. C. 128
Hotchkiss, O. C. 374
House, A. E. 66
Howe, E. J. 320
Hughes, R. W. 161
Hunt, M. I. 186
Hustleby, H. C. 115
Hutchinson, B. W. 153
Hutchinson, H. D. 283
Hull, P. M. 16

Ingalls, W. A. 282
Ives, W. H. 430

Jackson, L. L. 380
Janes, M. E. 315
Jasper, Brother 93
Jewell, Ross 137
Johnson, S. S. 362
Jones, F. B. 123
Jones, H. B. 43
Jones, P. J. 286

Keck, C. E. 431
Keller, Christopher 207
Kelley, R. B. 127
Kellogg, Brainard 25
Kelsey, W. B. 295
Kennedy, G. W. 311
Kennedy, John 63
Kent, A. E. 302
Kerr, W. D. 432
Keyser, R. S. 389
Kimm, S. C. 222
King, F. D. 195
Kingsley, J. S. 241
Kinney, W. H. 208
Knapp, E. F. 172

Lath, E. M. 234
Lavery, A. A. 61
Lawrence, J. B. 230
Lee, Nicholas 94
Lehman, D. C. 291
Lester, F. V. 339
Lester, J. D. 327
Le Valley, R. T. 262
Linnell, W. J. 71
Lisk, W. H. 58
Livingston, B. C. 404
Lobdell, N. L. 97
Locke, G. H. 445
Lockwood, S. R. 169
Lomber, E. H. 433
Loveless, H. S. G. 261
Lovell, T. B. 243
Lowery, J. E. 381
Luce, E. B. 131
Lusk, J. L. 348
Luttenton, C. V. 41
Luttenton, H. W. 399
Lynch, W. H. 49
Lyttle, E. W. 6

Mabey, C. G. 231
Mabie, R. A. 101
Mabon, J. P. 182
McClellan, S. D. 226
MacDonald, R. A. 185
McDowell, E. E. 254
MacElroy, A. J. 373
McEvoy, P. J. 199
McFarlane, C. T. 379
McGinity, I. J. 85
McKinley, E. F. 149
McLachlan, A. C. 388
McLennan, Christina 408
Malloch, J. C. 206
Mason, A. R. 236
Matteson, M. A. 340
Maurice, Brother 92
Maycock, M. M. 384
Medden, F. J. 145
Merrill, F. O. 434
Merritt, E. G. 313
Mider, C. A. 355
Millar, W. J. 139
Miller, A. C. 202
Miller, E. C. 117
Miller, F. G. 274
Miller, F. L. 409
Miller, W. W. 151

Millias, W. L. 351
Milne, J. M. 387
Milne, W. J. 33
Moore, E. L. 284
Morelock, O. J. 205
Morey, B. I. 289
Morey, C. L. 164
Morgan, W. L. 397
Morrow, H. T. 48
Morse, E. M. 51
Mosher, C. L. 81
Mosher, Ralph 219
Mott, L. H. 113
Moulton, F. N. 312
Mulford, C. W. 64
Multer, M. J. 281
Murdoch, J. G. 344
Murray, E. W. 398

Naylor, D. H. 176
Neff, S. J. 209
Norris, J. C. 77
Norton, A. H. 221

Ottaway, G. H. 79

Paessler, V. S. 62
Palmer, C. S. 53
Palmer, N. W. 410
Patrick, W. B. 57
Peck, E. J. 8
Peck, J. G. 329
Peckham, Allen 435
Plough, M. C. 167
Pooler, B. G. 306
Preston, A. M. 56

Randolph, E. M. 223
Ray, P. A. 436
Rayfield, W. W. 189
Redman, E. S. 181
Redmond, D. W. 99
Reed, H. G. 89
Rhees, Rush 32
Richards, C. O. 324
Richards, C. W. 265
Richardson, A. C. 385
Rickard, H. D. 60
Ripton, B. H. 27
Rider, A. B. 437
Rix, W. S. 376
Robbins, E. B. 141
Robins, L. F. 294
Robinson, Ernest 95
Rockwell, J. C. 438
Root, J. W. 303
Roulston, R. S. 259
Rowley, L. E. 439
Rulison, H. V. 359
Russell, H. J. 103
Russell, H. L. 268

Sanders, E. M. 110
Sanford, C. G. 203
Sanford, E. M. 55
Saunders, E. P. 44
Schaible, G. C. 305
Scheck, C. C. 372
Scoville, J. M. 147
Scripture, A. M. 237
Searle, R. B. 190
Seely, C. D. 382
Shattuck, G. H. 440
Shaver, C. A. 17
Shepardson, F. L. 102
Shields, B. X. 42
Simons, F. D. 133
Skerritt, H. T. 441
Skinner, A. W. 257
Skinner, C. R. 1
Slawson, S. J. 367
Smith, C. J. 304
Smith, D. B. 121
Smith, E. E. 76
Smith, F. E. 108
Smith, M. C. 50
Snell, H. H. 180
Snyder, R. H. 36
Snyder, R. P. 239
Somers, W. J. 96
Spaulding, F. R. 263
Spencer R. V 314
Stark, Clifford 442
Steele, L. N. 233
Steele, W. S. 256
Stout, I. H. 14
Stowell, T. B. 395
Stryker, M. W. 22
Stuart, E. A. 200
Summerbell, Martyn 273
Switton, Max 171
Sykes, G. D. 335
Symes, J. J. N. 21

Taylor, E. W. 210
Taylor, H. L. 2
Thompson, J. M. 279
Tifft, W. C. 129
Tilbury, H. B. 267
Toaz, R. K. 269
Tolman, H. N. 100
Tomlinson, E. M. 29
Townsend, C. W. 341
True, W. R. 174
Truesdale, W. H. 154
Tuthill, L. H. 178

Upham, A. A. 69

Van Allen, E. K. 40
Vandegrift, C. W. 52
Van Dusen, Fred 255
Van Ingen, B. C. 252
Van Zile, F. W. 73
Vincent, H. E. 443
Vosburgh, C. D. 125
Vossler, A. B. 360

Wallace, F. H. 72
Walrath, M. H. 345
Walter, C. F. 321
Walter, H. J. 364
Ward, W. A. 290
Warfield, C. H. 201
Waterbury, W. H. 83
Watkins, A. H. 296
Weatherlow, H. P. 82
Webster, F. P. 120
Weet, H. S. 249
Welch, R. S. 403
Welker, W. G. 370
West, W. L. 192
Westfall, F. M. 346
Wheaton, Henry 343
Wheelock, C. F. 3
White, F. C. 107
White, Henry 23
White, N. K. 67
Whitford, B. F. 277
Whitney, C. W. 70
Whittaker, B. E. 84
Wickes, W. K. 336
Wight, P. L. 98
Wilber, T. C. 136
Wilcox, A. H. 298
Wiley, G. N. 122
William, Brother 308
Williams, C. S. 90
Williams, D. B. 138
Williams, F. B. 28
Williams, Sherman 15
Williams, W. R. 148
Wilmot, H. T. 88
Wilson, C. H. 444
Winne, James 396
Wood, F. H. 18
Wood, O. W. 114
Wood, W. M. 330
Woodworth, H. C. 106
Woolsey, C. H. 287
Wright, A. M. 13

Youmans, Scott 191

INDEX

Action, summary of, 321-27.
Anderson, J. M., quoted, 341-42.
Appointments, 321.
Arithmetic, study of, 361, 363, 364.
Armstrong, T. H., address, 431-32.
Attendants, register, 433-48.

Ball, George H., on universal need of business education, 365-66.
Banta, Joseph Edward, on manual training in the high school, 394–96; High School Societies, 397–402.
Belknap, Emmet, The High School in its Relation to Commercial Education, 339–52; on commercial subjects, 354; on examination in advanced spelling, 378.
Bookmyer, T. W., quoted, 344–45.
Boynton, F. D., on examination in advanced spelling, 377.
Brown, F. H., on high school fraternities, 405.
Business education, *see* Commercial education.

Children, per cent entering high schools, 358.
Chriswell, W. B., on preparation for college and preparation for life, 373–74.
Clark, John Holly, on examination in advanced spelling, 377–78.
College, preparation for, in English, discussion, 366–79.
Commercial education, high school in its relation to, paper by Emmet Belknap, with discussion, 339–66.
Committees, appointments, 321.
Composition, 366–79.
Conant, Howard, on examination in advanced spelling, 378–79; on manual training, 391.
Crissy, I. O., quoted, 340, 347, 348–49; on business education, 352–54.

De Garmo, Charles, quoted, 341, 349–51.

Educational exhibit at the St Louis Exposition, 323, 409–10.
Eliot, Charles William, quoted, 344.
English, study of, 362; preparation for college in, discussion, 366–79.
English education, 325.
Executive committee, 325.

Farr, D. C., resolutions presented by, 325-26; report on plan of proceedings, 326; on technical education, 354–55; on examination in advanced spelling, 377.
Fosdick, Frank S., on high school fraternities, 406–9; retiring address, 430–31.
Fraternities in high schools, discussion, 397–409.

Gaines, C. C., on training for business in grammar grades, 358–63; on study of arithmetic, 361, 363, 364.
Greetings of Associated Academic Principals to other educational bodies, 326–27.
Griffith, George, quoted, 343–44, 346; on commercial courses in the high school, 355–57; on high school fraternities, 406.

Handwriting, 361.
Herrick, Cheesman A., quoted, 346.
Herron, Schuyler F., on high school fraternities, 402–4, 405.
High school, specialization in, 325; relation to commercial education, paper by Emmet Belknap, with discussion, 339–66.
High school societies, discussion, 397–409.
Hodge, L. F., on method of giving Regents examination in reading, 374–75.
Hoffman, L. W., on commercial courses, 364–65; on manual training in small high schools, 388–89.

Hutchinson, B. W., on study of English in New York State, 376.
Hyde, William De Witt, quoted, 340.

Locke, George H., on manual training in high school, 396-97.
Lush, J. L., on study of arithmetic, 363; on comparison of present with former work of high school, 389-90.

Mac Elroy, A. J., on high school fraternities, 404.
McKinley, E. F., on commercial courses in the high school, 357-58.
Manual Training in Villages and Small Cities, paper by V. S. Paessler, with discussion, 379-97.

National Educational Association, representation at, 322-23.
Nominations, committee on, 321, 325.
Nonresident pupils, state aid to, 321-22, 325-26.

Odell, Benjamin B., resolution of thanks to, 322, 325.
Officers of association, 319, 325.

Paessler, Vinton S., Manual Training in Villages and Small Cities, 379-88; on manual training, 391-93.
Penmanship, 361.
Proceedings, plan of, 326.

Reading, aloud, 366-79; method of giving Regents examination in, 374-75.
Register of attendants, 433-48.
Reports, 323-24.
Resolutions, committee on, 321, 325-26.
Rhees, Rush, resolution of thanks to, 325; Thoroughness versus Breadth, 328-38.

St Louis Exposition, representative of Academic Principals Association on committee, 323, 409-10.
Schoolmasters, strike of, by W. K. Wickes, 411-30.
Secondary schools, too greatly expanded curriculum, 325.
Sessions, summary of, 319-21.
Smith, Ernest E., report as treasurer, 323-24.
Spelling, 366-79; advanced, examination in, 376-79.
State aid to nonresident pupils, 321-22, 325-26.
Stout, Isaac H., on state aid to nonresident pupils, 322.
Stryker, W. M., The Different and Indifferent Degrees of Preparation for College that appear in English, Specially in Composition, Spelling, and Plain, Old-Fashioned Reading Aloud, 366-73.

Taylor, Henry L., on educational exhibit at the St Louis Exposition, 323, 409-10.
Thoroughness versus Breadth, by Rush Rhees, 328-38.
Thurber, Charles H., quoted, 346.
Treasurer's report, 323-24.

Washington, Booker T., quoted, 383.
Wheelock, Charles F., resolutions on state aid to nonresident pupils, 322; on examination in advanced spelling, 376-77.
White, F. C., on manual training in the high school, 393.
Wickes, William K., Strike of the Schoolmasters, 411-30.
Winship, Albert Edward, quoted, 345-46.

High School Department

PUBLICATIONS

Examination Department annual reports 1894–97. O.
a vol.

Till 1894 these reports formed part of the general University reports, kn
the Regents reports. They cover courses of study in secondary schools, ex
tion of professional students, licensing examinations for physicians, d
veterinary surgeons and certified public accountants.

Continued in 1898 as reports of College and High School Departments.

Examination bulletins 1895–98. O. To advance subscribe
a year.

B4 (Examinations 1) Regents Examinations. 82p. Nov. 1890

Historical sketch, laws, ordinances and rules pertaining to all examinatio
ducted by the Regents; details as to all University credentials; subjects,
and places of examinations 1891–95; notes on the reorganization of 1890.

B5 (Examinations 2) Academic Syllabus. 174p. Ap.
Replaced by X8.

B10 (Examinations 3) Medical Syllabus. 30p. Oct.
Replaced by X7.

B13 (Examinations 4) Law Syllabus. 120p. Mar. 1893. *Out of*

Outline of ground covered by examinations for the Regents degree of ba
of laws.

B23 (Examinations 5) Report of Examination Department
82p. Feb. 1894. *10c.*

X6 Report of Examination Department 1894. 126p. Mar. 1895

X7 Medical Syllabus. 128p. Mar. 1895. *25c.*

Outline of ground covered by state licensing examinations, prepared
direction of state boards of medical examiners for guidance of candidates.

X8 Academic Syllabus. 204p. June 1895. *Replaced by* X2

Syllabus of Form Study and Drawing. 30p. 32pl. *25c.*

Reprint of p.410-24d and plates from X8.

X9 Report of Examination Department 1895. 108p. Feb. 1896

X10 Examination Papers 1896. 502p. Oct. 1896. *50c;*
size uniform with previous volumes 25c, boards 50c.

See also Question papers.

X11 Davis, W: M. (Harvard) State Map of New York a
Aid to the Study of Geography. 28p. Nov. 1896. *5c.*

Based on the topographic map in preparation by the United States Geol
Survey.

X12 Report of Examination Department 1896. 114p. Jan. 1897

X13 College-entrance English. 148p. June 1897. *15c.*

Present English entrance requirements of representative colleges and uni
ties. Also discussions on aims and methods in teaching secondary school En

X14 Examination Papers 1897. 578p. Aug. 1897. *Price, see*

X15 Report of Examination Department 1897. 120p.
1897. *15c.*

X16 *Examination* Papers 1898. 512p. Sep. 1898. Price, se

High School Department annual reports 1898–date. O. *75c a*
High School Department bulletins 1898–date. *To advance su*
cribers 50c a year.

X17 (High school 1) Director's Report 1898. Mar. 1899. 122p. *15*
X18 (High school 2) State Science Teachers Association. Pr
ceedings of the Third Annual Meeting, Dec. 1898. 202
Nov. 1899. *Out of print.*
X19 (High school 3) Associated Academic Principals. Proce
ings of the 14th Annual Conference, Dec. 1898. 236
Dec. 1899. *25c.*
X20 (High school 4) Academic Examination Papers 1899. 306
Oct. 1899. *25c. Small size* 12.5 x 20 *cm, 25c; boards, 50c.*
X21 (High school 5) Director's Report 1899. 70p. Feb. 1900. 10
X22 (High school 6) Associated Academic Principals. Proce
ings of the 15th Annual Conference, Dec. 1899. 188p. Ma
1900. *20c.*
X23 (High school 7) State Science Teachers Association. Pr
ceedings of the Fourth Annual Meeting, Dec. 1899. 302
May 1900. *35c.*
X24 (High school 8) Academic Syllabus. 226p. Ap. 190
25c; cloth, 50c.

The University declines to recommend any special textbooks, but for t
guidance of teachers and students it specifies the ground covered by the p
liminary and academic subjects. This syllabus is the best available outline
what should be accomplished in these subjects.

711 B X25 (High school 9) Manual Training Syllabus. 60p. Ma
1900. *10c.*
X26 (High school 10) Academic Examination Papers 1900. 306
Aug. 1900. *Price, see* X20.
X27 (High school 11) Director's Report 1900. 38p. Feb. 1901.
X28 (High school 12) Associated Academic Principals. Proce
ings of the 16th Annual Conference, Dec. 1900. 164
Ap. 1901. *25c.*
X29 (High school 13) State Science Teachers Association. Pr
ceedings of the Fifth Annual Conference, Dec. 1900. 250
May 1901. *35c.*
X30 (High school 14) Academic Examination Papers 190
322p. Aug. 1901. *25c; boards, 50c.*
X31 (High school 15) Director's Report 1901. 34p. Jan. 1902. *10*
X32 (High school 16) Associated Academic Principals. Proce
ings of the 17th Annual Conference, Dec. 1901. 196p. Ma
1902. *25c.*
X33 (High school 17) State Science Teachers Association. Pr
ceedings of the Sixth Annual Conference, Dec. 1901. 312
Oct. 1902. *40c.*
X34 (High school 18) Academic examination Papers 1902. 316p
July 1902. *25c; boards, 50c.*
X35 (High school 19) Associated Academic Principals. Proce
ings of the 18th Annual Conference, Dec. 1902. 136p. Ju
1903. *20c.*

Question papers. For the academic year 1892 (v. 1); 1893 (v. 2)
1894 (v. 3); 1895 (v. 4). D. *25c; boards, 50c.*

For 1896–1902 see X10, X14, X16, X20, X26, X30, X34. Till 1898 each volu
contained all the Regents question papers of that year in any of the academ
professional law, medical, dental, veterinary, library and extension examin
tions. After the first edition of the 1898 examination papers the academ
and professional papers were separated.